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ORIGINAL ARTICLES

THE MODERN TREATMENT OF TUBERCULOSIS; THE CLIMATIC FALLACY.

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INTRODUCTORY.

In the series of articles which I have been asked to contribute to the ILLINOIS MEDICAL JOURNAL on the subject of tuberculosis it shall be my purpose to bring together as briefly as possible those facts with regard to the modern treatment of tuberculosis which either are not well understood or, if understood, are loosely applied. The real test of a therapeutic principle is in its application. Measured by this standard, the modern treatment of tuberculosis is in many respects a disappointment; not because the principles are not correct, but because of the loose and imperfect methods by which they are administered. "A misapplied truth is one of the worst forms of error."

CLIMATE.

Old views die hard, and prejudice is difficult to overcome. Nothing is more fallacious than the belief that climate is an essential factor in the treatment of tuberculosis. The absurdity of the claim that climatic conditions alone are responsible for the cures which may be and are effected in certain localities are the more apparent when we analyze the evidence presented in favor of this belief.

In view of the fact that for generations the medical profession have regarded climate as the principal factor in the treatment, it is not surprising that the laity and even many of the profession should still cling to this opinion. We cannot make substantial progress until we entertain more rational views with regard to the part which climate plays in the treatment. The numerous localities which have hitherto laid claim to special advantages in the treatment of this disease represent practically all climatic conditions in all the civilized countries of the globe, as to

altitude, humidity, dryness, temperature, etc. In fact, each place insists that the curative properties of that particular climate resides in the special atmospheric feature which is most prominent in that locality.

We note that in Europe it is insisted that the cold, humid atmosphere of the north, the murky atmosphere of Great Britain, the somewhat milder climate of Germany, the mountainous region of Switzerland, the more equable and balmy coast of the Mediterranean, each and all lay claim to some special climatic feature which makes it the most desirable for the tuberculous patient. In our own country we find that the arid regions of the southwest have long enjoyed especial distinction. Not only these localities but the clearer, more invigorating and elevated regions of the Rocky Mountains, the less elevated, humid and milder climate of California, and even the Adirondacks and Canada, with their long and very severe winters, are likewise recommended. Each of our own northwestern states has at one time or another, especially when the country was new, enjoyed more or less distinction as a resort for tuberculous invalids.

No doubt cures were and are effected in these several climates under all these varying conditions, which goes to prove that climate itself and of itself is not the agency which has effected a cure, but purity of air, which is not peculiar to any climate or locality. The fact that the sanatoria located in all these different countries are doing good work, the results being substantially the same everywhere where the conditions as to outdoor life, nutritious food and properly regulated exercise are complied with, is additional proof that the favorable results cannot reasonably be attributed to climate alone. We of the middle west and northwest have been sending our patients year after year to the west and southwest. A writer for a prominent magazine recently made a special tour of the southwest for the purpose of investigating conditions from the standpoint of a layman and reports that at least 20,000 persons suffering from consumption are going into that section each year, and of this number at least 12,000 die within the first twelve months. These unfortunates are blindly and vainly searching for that health which the popular delusion with regard to climate is supposed to bring.

In answer to the question, what becomes of these unfortunate victims of their own recklessness or bad advice, he says: "They are wanderers. The Arabs of the great southwest, moving from place to place. Having no home or occupation. Many of them but very little money. A few stay to get well, or at least regain health enough to become permanent residents. Many coming to realize the inefficiency of climate, return to their homes to linger a while among friends until exhausted by the weary search for health, and worn out by the disease, they die, pitiful sacrifices, not only to consumption, but to the popular delusion as to the advantages of climate."

In a recent issue of *Collier's Weekly* comes an appeal from Arizona which is heartrending. The facts set forth are not peculiar to that locality alone, but to all the popular resorts for this class of invalids. The writer says: "If the people throughout the United States could only

see the condition of poor consumptives who reach Phoenix or be made to realize the horror of it they would cease sending their relatives here unless they had sufficient means to care for them.

"*Climate alone does not cure.* The patient must have nourishing food, properly selected; tender care and nursing; pleasant surroundings, and everything that would tend to take his mind from himself and his terrible affliction. How I wish everyone throughout the country could see these poor, hopeless, helpless human beings sent here by relatives who think they are doing the best thing for the afflicted. A crime has been committed where it was sought to do only good."

Notwithstanding the facts herein set forth are apparent to anyone who has given the subject serious thought, physicians who ought to know better are still indiscriminately sending patients away from home simply because it is the conventional and easiest thing to do. It requires some courage as well as energy to combat old ideas. Many physicians are simply drifting with the tide instead of using their scientific information, opportunities and influence to teach the people the truth with regard to this great question of tuberculosis which is just now engaging the attention of the whole civilized world as no other question effecting the public health has ever done. The immediate duty which lies before the profession is to teach the people that the cure of tuberculosis does not depend upon climate, and where patients persist in blindly seeking a climatic cure, as many of them will, let the responsibility rest upon them and their friends who are ever ready to give well-meant but bad advice. When this delusion with regard to climate is dispelled we will then be in a position to begin an intelligent and well-directed fight against the disease. A mere assertion is not sufficient to settle a controversial question. The consensus of opinion of those who have made a study of this question, while not conclusive, should be accepted as our guide until such time as the issues involved are more definitely settled.

The Committee of the National Association for the Prevention of Tuberculosis, in an exhaustive report of that body on the influence of climate in pulmonary tuberculosis, says: "No advanced worker in this line would to-day, as was formerly done, place climate first in the order of therapeutic measures. Let it never be forgotten that hygiene, diet, teaching and supervision must always come first, but granted that they are properly attended to, then enters the powerful rôle of climate reinforcing and accentuating the effects of these other measures and yielding results that cannot be approached even with the same care and watching and food in less favorable climates." This is included in a majority report of a committee all but one of whom was made up of men eminent in the profession, but each and all represent various climatic resorts. It is not to be expected that these gentlemen would be willing to concede more than to place climate in a subordinate place. In this statement there is no intention to cast any aspersion upon the character of these gentlemen. It must be borne in mind that each and every one of them formerly insisted that climate was the *sine qua non* in the treatment

of tuberculosis, and it is a great concession for them to now make the statement that climate plays a subordinate rôle. Their statement probably approximates the truth, but is quoted more for the purpose of showing the great change which has taken place in professional opinion on this subject, even among those who might reasonably be excused by reason of their education and environment, if they still adhered to the old idea that climate was an essential factor in the treatment.

One member of that committee, Dr. L. F. Flick of Philadelphia, and the only one not representing a climatic resort, refused to concur in the report, and in the discussion is reported as follows: "I wish to record myself as holding to the opinion that there is absolutely nothing in climate in the treatment of tuberculosis. I am convinced that it is a question of method, and that that method can be successfully carried out in any climate. . . . Proper living in the open air with proper diet and proper discipline will give the results, and it remains for the climatologists to demonstrate that they can produce with climate what we can not produce without it."

Dr. Arthur Ransome, an eminent English authority on this subject, says: "Our views in regard to climate have, indeed, undergone considerable modification in recent years. Not long ago a medical man who neglected to recommend to a consumptive a change of climate would have been regarded as entirely wanting in medical knowledge. Since this time a distinct change has come over the opinions of most medical men who now regard the question of climate as of quite secondary importance."

Dr. Arthur Latham, another eminent English authority, says: "The results of sanatorium treatment in a variety of climates have shown that the old ideas of a particular climate or altitude being a specific for pulmonary consumption are erroneous. Climate in itself is not everything. Any climate will do for the treatment of tuberculosis, provided that the air is pure and bracing." He also says: "As far as possible *all patients should be treated under the same climatic conditions as those which they are likely to experience in their subsequent life,*" and, "There can be no doubt that the best and most permanent results are obtained in cold, bracing climates, rather than in warm, or tropical, ones, and certainly the great majority of English patients will do well to avoid warm climates, more especially when these are moist."

Coming to our own country, we quote from Dr. Norman Bridge, than whom we have no better authority, both from the standpoint of eminent professional ability, and also for the reason that he was at one time a victim of the disease. He says: "It (climate) should never be prescribed unless one is sure that it can be taken in the right way and be attended by all the aids that are otherwise available. Many times it is worse than useless. The patient in any climate must be properly fed, housed, clothed and warmed. It is just as important that he should have contentment and mental peace. I would rather have a patient kept in the outskirts of an eastern city (or even in the heart of the city) under hygienic management, sleeping in the best air obtainable winter

and summer, and with his friends and comforts about him, than to send him to some better climate to shift for himself, and be lonesome and homesick. If a patient can have all the conditions for happiness in the new country, then the right change of climate is the thing of paramount importance; but to send him away to a strange region to shift for himself and perhaps to do a hundred foolish things is worse than useless."

Dr. John C. Huber says: "No particular climate is essential for the cure of consumption. It is not so much where the consumptive lives as how he lives that is of the most importance."

Dr. A. P. Francine, Director of the Pennsylvania Society for the Prevention of Tuberculosis, says, in concluding a discussion in a recent work on the Modern Treatment of Pulmonary Tuberculosis: "Without attempting to dogmatize upon the question of climate, one important fact stands out, i. e., the sooner the general practitioner or internist ceases to advise change of climate promiscuously, the better it will be for the consumptive in general and for those of small means in particular. Too often the physician, out of thoughtlessness or of habit, advises a change of climate to those who can ill afford it, or who are not really proper cases from a medical point of view to be sent away. Poor people often make a financial effort to pay one visit to some well-known physician for an opinion or diagnosis. The latter finds him suffering from tuberculosis, usually well advanced, and with self-complacent irresponsibility advises him to 'go out west.' He may even go so far as to tell him that in this course lies his only chance of getting well. Such advice can not be too strongly condemned, both from a professional and humanitarian standpoint."

Dr. S. A. Knopf, of New York, in speaking of the cure of tuberculosis, says: "What is most interesting to know is that this cure can not only be accomplished in California and Colorado, but also in our own home climate."

Dr. Henry P. Loomis, of New York, who is still an advocate of climate, concedes that, "not the most beautiful and healthful climate, nor the most delightful resort can cure the consumptive patient if he is not wisely guided in treatment."

Dr. Burney Yeo pithily remarks: "Cure without climate is better than climate without cure."

Several of the opinions quoted above were rendered from two to five years ago. Since that time more and stronger evidence has accumulated in favor of the universal application of the modern treatment.

The latest authority from which I can quote is the Practical Medicine Series, just issued, in which, in answer to the question, "Should the physician send his tuberculosis patient to Colorado?" Dr. W. H. Watterson, who, in addition to his recognized ability as a physician, has recently been a patient in that state, protests strongly against the indiscriminate sending of patients to Colorado. He says: "Climate in itself is not a specific, and, to gain a cure, only those cases should be sent who know where they can be cared for, and with none of the complications contraindicating high altitude and with not less than $500 a year to live

on. It is essential that they go to a well-regulated sanatorium, that they may have the oversight necessary on reaching new conditions of life and climate. So much can be done in less favorable climates with good care that it is not worth the expense and effort to go away to an unregulated life with no good food nor medical care."

In summarizing the accumulated evidence on this question up to date, the authors say: "The sanatorium movement has demonstrated that climate is not essential; open-air life is essential. Fresh air, rest, good food, regularity in life, and faithfulness in living up to the rules are the key to a cure."

Dr. John Wethered, Medical Director Y. M. C. A. Health Farm, Denver, Colo., in a personal interview, said: "No matter how bright the sun, or how bracing the atmosphere, if the surroundings nag a man, if the people he is with annoy him, if he gets to brooding over business or home affairs, or if he has been compelled to fill up on bad food and water, everything will look blue to him. On the other hand, it concerns him little if the weather is bad, providing his surroundings are pleasant, the people agreeable, nothing bothering his mind and when he is 'pressing his buttons' with a good meal."

Concurrent opinions could be multiplied indefinitely. The above, however, it would seem, should satisfy the most captious and convince the most skeptical.

That climate is not a necessary factor has been amply demonstrated by Dr. Bowditch of Boston, who has for eleven years been treating poor consumptives in his sanatorium at Sharon, where in the low, damp climate of New England, not far removed from the Atlantic coast, which, according to previously accepted standards, may justly be regarded as an exceedingly unfavorable climate, he has been able to secure results equal to those obtained in what we have been inclined to consider more favorable climates. Many sanatoria in Germany and England are placed in parts of the country which are subject to frequent fogs and where the relative humidity is unusually high, but in spite of these drawbacks a very satisfactory percentage of these patients are sent home either well or nearly so. These results have been duplicated over and over again in all well-conducted sanatoria everywhere.

Not only thousands of lives are being sacrificed to this popular delusion as to climate, but enough money is being annually spent to have effected at home a cure of the curable and properly cared for the incurable. We are learning the truth that there is no particular climate for consumption. Wherever there is pure air, there will the sufferer from tuberculosis find a place to fight his disease if taken in time. There the large majority of sufferers can be cured, if they can at the same time obtain proper food and rest under intelligent medical direction. This is a truth which has been amply demonstrated by the successful fight which has been made in all climates where the principles of treatment as now understood are systematically carried out. The climatic cure of consumption is largely a tradition. The tuberculous patient can be and should be, as a rule, treated in his home climate wherever this may be.

It is not a question of altitude, dryness, humidity, or any of those atmospheric conditions to which we have usually attributed the cure. In so far as climate has had any influence, it has been simply a question of fresh air. The curable case can more certainly and cheaply be cured at home. The incurable should not be sent away to die, friendless and alone, but kept at home where he can at least enjoy the comforts of a home and the society of friends during his months or years of suffering.

Whatever may be the value of climate, the fact remains that only a very few can avail themselves of it in a rational manner. This being true, it is idle to quibble or waste our time in controversy. People of means and leisure are in a position to elect what they shall do. They do not need our assistance, and usually will not take our advice. Our responsibility is for that vast army of consumptives who for one reason or another are compelled to remain in their home climate. Even if we concede all that is claimed for certain climates (which, in view of rapidly accumulating facts, we do not), financial reasons alone would preclude its general application. In addition, there is the practical impossibility of getting certain articles of food which are so essential, as, for example, milk and eggs. These must be fresh, which makes it necessary that they shall be produced very near the place of consumption. This can not be done to advantage (if at all) in the arid regions of the southwest or the mountains of the west. It is a well-known fact that the food products which the tuberculous patient most demands are not only very expensive, but always difficult and not infrequently impossible to obtain.

In a recent visit I investigated conditions and results in the west and find all the medical men whom I interviewed practically in accord with the opinions so freely quoted above. Only those insist on climate as an important factor who are ignorant of existing conditions elsewhere or are directly interested in keeping up the delusion.

It should not be the purpose of those who do not regard climate as of primary importance to deny that it has some value. This is neither fair nor in accordance with that scientific spirit which gives lasting value to our work. Nothing is gained by overstatements for or against climate. Some patients will do better in one climate than in another. This, however, is usually a matter of experiment and can not be determined in advance. While it is true that some patients will do better by sending them to a mild climate at a higher altitude, it is also true that it is often necessary to change to a colder climate and a lower altitude. It is not to climate as it may be applied to which objection is made, but to climate as it is applied. It will find its proper place as a therapeutic agent with a readjustment of our opinions based upon the facts of experience as these shall accrue. Sanatoria have demonstrated that climate is not an essential in the treatment. What has been said of whisky applies to air: "Some may be better than others, but none is poor." No doubt a cure can be effected more pleasantly in a mild climate, but not more profitably. The leading physicians of the west are all agreed that climate can not be depended upon for a cure; that under no conditions do they advise the return of improved or apparently cured patients to their

home climate, and that sanatoria are as essential in the treatment of tuberculosis in the so-called favored climates as elsewhere.

Then, too, in the discussion of climate, we rarely ever hear of its disagreeable features, such as excessive heat, high winds, and more particularly dust and sand storms, which are often simply intolerable. We hear nothing of homesickness, the lack of proper direction, and, above all, the woeful dearth of accommodations for the care of the multitude of climatic health seekers. These are facts which are kept in the background. The truth is (and it can not longer be concealed) that climate has been commercialized, not to the advantage of the victims of tuberculosis, but for the benefit of those who live upon them. This indictment is not meant to include the many intelligent and conscientious physicians and others who are residents of the several health resorts who deplore and condemn the unfortunate conditions which exist and are doing everything they possibly can to remedy the evils.

It would seem a superflous task to argue a question which has been so clearly proven and so generally admitted, were it not for the fact that our actions are still governed by our traditional ideas. If for any reason, good or bad, tuberculous patients are sent from home, they should be consigned to the care of some physician residing at the point of destination, who will be charged with the responsibility of looking after and directing them; or, better still, sent to sanatoria in the places to which they are sent.

It is woeful to note the ignorance as well as the indifference displayed by the average health seeker when left to his own inclination. He generally lands in the new locality full of preconceived ideas and determinations which, if left uncorrected, tends to militate against his recovery. Especially is he apt to drift into hotels and boarding houses which have been repeatedly occupied by other victims of the disease, unconscious of the fact that in so doing he is liable to inherit new infection from some former occupant. He seeks to while away the time and relieve homesickness by indulging in many pleasures and pastimes which should be absolutely forbidden. The theaters, cheap playhouses, saloons, and even gambling houses are the frequent resorts of uncontrolled health seekers. These and a number of other fallacies prevail and emphasize the necessity of having a protector placed over them.

This information is based on personal observations and reinforced by the statements of numerous physicians with whom I conferred. Those who have observed the army of tuberculous patients who are traversing every highway and byway of prominent climatic resorts have witnessed not only these object-lessons, but others not easily forgotten.

In conclusion, permit me to ask of my colleagues who may read this paper:

How many patients of your acquaintance have returned from the milder climates cured or benefited and not subsequently relapsed?

How many who have sought a climatic cure have remained long enough to derive any benefit?

How many patients and their immediate families have been impoverished in the vain search for a climatic cure?

If it is still insisted that climate is such an important factor, why is it necessary to build sanatoria in the so-called favorable climates and there be compelled to comply with exactly the same conditions as are necessary to obtain success elsewhere?

It is not possible to secure statistical information in answer to these questions, but will it not be well for the conscientious physician to look about him for such an answer as he can obtain from his own experience before he takes the responsibility of advising his patient to "go west"? The time has come when physicians who assume the responsibility of advising tuberculous patients will be held to a stricter accountability than in the past, and those who fail to recognize their duty in this respect will find themselves displaced by their more conscientious and progressive colleagues.

GENERAL CONSIDERATIONS CONCERNING OPSONINS AND THERAPEUTIC INOCULATIONS OF DEAD BACTERIA.*

LUDVIG HEKTOEN, M.D.
CHICAGO.

It has been shown conclusively that at least experimentally phagocytosis of many bacteria is dependent on certain substances which become attached to the bacteria and so change them that they are taken up by polymorphonuclear leukocytes. These substances, whose discovery we owe principally to Wright and Douglas, are called opsonins. We know that injection of animals with suitable bacteria, as well as with alien red corpuscles, may give rise to specific newly formed opsonins; and in human beings specific opsonins may arise either as the result of spontaneous infection or of artificial introduction of dead bacteria or bacterial products. By means of the opsonic index the fluctuations in the opsonin in the blood may be followed more or less accurately.

As is well known, the opsonic index is supposed to represent the relative amount of an opsonin in the serum of an individual as compared with the normal standard in that case. Speaking generally, the opsonic index with respect to a given bacterium is obtained by dividing the average number of bacteria taken up per leucocyte, under the influence of the serum of the person in question, by the average number taken up per leucocyte under the influence of standard normal serum under conditions that are absolutely comparable.

There seems to be general agreement among investigators to the effect that after the injection of a suitable dose of bacteria there is usually a definite fall of the index of the injected person or animal, followed by a rise above normal and more or less gradual return to the normal. It has been found, too, that in many infections there are distinct changes in the specific opsonic index; thus in acute infections, like pneu-

* Read in Symposium on Opsonins before meeting of Chicago Medical Society, Oct. 30, 1907. For discussion see page 89.

monia, diphtheria, etc., there is first a fall and then as the symptoms subside a definite rise. In more or less stationary local infections the index may be low or there may occur irregular fluctuations.

The demonstration that opsonins renders bacteria susceptible to phagocytosis does not prove that they are of importance. It must be shown that phagocytosis is essential for the destruction of the bacteria. Denys several years ago showed that in mixtures of normal rabbit leucocytes and normal rabbit serum there was little or no destruction of virulent streptococci, whereas, when immune serum, i. e., serum rich in opsonin, was substituted, prompt phagocytosis with complete destruction of the streptococci took place. The serum alone of normal persons and of patients with streptococcus infections has no streptococcidal effects, but constitutes a good medium for streptococci; Ruediger, however, has shown that normal defibrinated human blood has some streptococcidal effect, that blood from patients with acute infections and leucocytosis has much greater destructive effect, and that the higher the leucocyte count the greater this effect. Rosenow has made analogous observations with respect to certain strains of pneumococci. Virulent anthrax bacilli grow freely in normal dog serum and in suspensions of washed dog blood corpuscles, but are destroyed in defibrinated dog blood, and this destruction is associated with marked phagocytosis. The essential rôle of intraleucocytic destruction of the bacilli is shown well in plates made with decreasing quantities of blood—the destruction decreases as the corpuscles (leucocytes) decrease even when the total quantity in all the tubes is made by means of dog serum.

While these facts undoubtedly indicate that opsonification and phagocytosis play an important part in many infections, there is still much that is obscure, particularly as regards the neutralization of the toxic substances produced by the bacteria in question, and I would mention especially the resistance offered by many virulent bacteria to phagocytosis by human leucocytes. Infectious microbes, after their entrance into the animal body, may so change their characters that they become immune to the animal antibodies. By way of illustration I may point out that Rosenow by elaborate experiments finds that avirulent pneumococci absorb human opsonin and become susceptible to phagocytosis, whereas virulent pneumococci do not absorb opsonin and are insusceptible to phagocytosis. Inasmuch as pneumococci freshly isolated from the blood in pneumonia invariably resist phagocytosis, the manner of their destruction within the body still presents complex problems that cannot be discussed now.

For centuries it has been a matter of common knowledge that recovery from an infectious disease leaves behind a more or less well-marked immunity to that disease. Advantage was taken of this fact in the inoculation of smallpox, and later the success of vaccination suggested that possibly infection with attenuated virus in general would give the same protection as infection with the fully virulent. In 1881 Pasteur successfully protected sheep against anthrax by means of the injection of cultures of attenuated anthrax bacilli. The principle of artificial

immunization or protective inoculation against disease of known microbic cause was now established, and it has been found that good protective reactions with the production of antibodies may result also from the infection of killed bacteria and of certain sterile bacterial products. The genius of Pasteur carried him still further when he conceived his preventive treatment of hydrophobia, which consists in the inoculation in an intensified manner of the modified, specific though as yet unknown virus during the incubation period, the resulting reactions in favorable cases completely neutralizing the infection. The first to practice injections of bacterial products for curative purposes in an established infection was Koch when he introduced tuberculin as a remedy for tuberculosis. Petruschky and Richardson, each quite independently, attempted to hasten the reactions that lead to healing in typhoid fever by the injection of sterile products of typhoid bacilli. Other efforts in the same general direction might be given, but, as the whole world knows, Wright is the one who has placed the treatment of infection in general by means of corresponding bacteria upon a more definite basis, and as the outcome of his enthusiastic advocacy the impression is growing that various infectious processes, especially when subacute and chronic, can be treated more or less effectively by the inoculation of the patient with proper doses of dead bacteria of exactly the same kind as cause the particular infection in question.

Therapeutic inoculations of dead bacteria are based upon the following considerations:

1. The power of suitable quantities of bacterial substance to stimulate the formation of specific opsonins and other specific antibodies.

2. The belief that the increased formation of such substances may promote healing of the corresponding infections.

3. The apparent inability of the body under certain conditions of natural infection to produce such substances in adequate quantities without special stimulation.

The essential prerequisites for therapeutic inoculations are: (1) correct etiologic diagnosis; (2) sterilized pure cultures of the bacterium causing the infection in each disease or sterile products of such bacterium; and (3) the injection of proper doses at proper intervals so as not to unnecessarily lower the antibacterial power or cause other unfavorable disturbances. As stated, at present interest is especially focussed on the methods elaborated by Wright and of which the essential feature is the use of such doses of killed bacteria as suffice to raise the opsonic index above normal.

The difficulties and the sources of error in the determination of the opsonic index seem to some to be so great that they question the reliability of the methods. The striking uniformity of certain outstanding results obtained by different observers under similar conditions, and the general harmony of these results with what one would expect on clinical and other grounds, seem to me to indicate that in competent hands the method is not wholly untrustworthy. On the other hand, it must be borne in mind that opsonins after all constitute only one of the

bodies or groups of bodies produced in the reactions of immunity and that consequently it may well be questioned whether they do constitute a reliable criterion of the antibacterial power under all circumstances.

While careful observers seem to agree that in the usual phagocytosis experiment the number of organisms taken up by the leucocytes, after allowing for the necessary error of experiment, is directly proportional to the concentration of the bacterial emulsion employed, there is no absolute proportionality between serum concentration and the number of bacteria taken up. Thus the number taken up may be nearly as great with one-half and one-fourth concentration of serum as with the full strength. This fact shows that the present method of opsonin determination is not as sensitive as desirable, as it may fail even under general ideal conditions to show differences actually present in the opsonin content of different sera, and it is quite probable that in the near future progressive serum dilutions will come into use in order to determine the relative amounts of opsonin just as are now used in making agglutination and precipitation tests.

Turning now to the consideration of the treatment of tuberculosis with immunization substances, it is interesting to note that Koch did not look upon his original tuberculin as an immunizing agent, but regarded the healing obtained as the result of more or less violent local reactions in the tuberculous foci. Now, however, the essential action of all tuberculins is ascribed to the stimulation of the machinery of immunization and the production of antibodies. The method of using tuberculin in whatever form is very important. At present there are at least two distinct procedures, which Trudeau designates the laboratory method and the clinical method. By the laboratory method is meant the method prescribed by Wright and in which the opsonic index is the guiding factor. In this case the dose of tuberculin remains minimal and practically the same throughout. This treatment has met with greatest apparent success in chronic local tuberculosis elsewhere than in the lungs. Indeed its value in pulmonary tuberculosis is, to say the least, questionable. The clinical method, which has developed more gradually during the past fifteen years or so and almost exclusively in connection with pulmonary tuberculosis, is controlled solely by the clinical course and manifestations. The original belief that definite course reactions are a necessary consequence of tuberculin treatment has been abandoned and great care is now recommended not to give larger doses than the patient can tolerate without marked reactions.

The main difference between the two methods is this: The laboratory or opsonic method takes no special account of the production of immunity to tuberculin, whereas the clinical method aims and tends to produce immunity to tuberculin without clinical reactions. We know that animals can be immunized to tuberculosis and tuberculous patients may be made insusceptible to 10,000 times the amount of tuberculin in that at first would cause signal disturbances. The coincident and often profound general improvement recorded in cases so treated

shows that progressive increase in dose need not be harmful, whatever the state of the opsonic index in the meantime may have been.

As regards the actual value of tuberculin immunization in pulmonary tuberculosis I can express no personal opinion. Careful mortality statistics are one means that in time can furnish unquestionable evidence of the value of the treatment. Trudeau's figures are encouraging, as they show, at the end of a period of fifteen years, that of the patients treated with tuberculin from 18 to 25 per cent. more were alive than those not so treated. Trudeau expresses well the difficulties in the way of final conclusions when he says: "The more familiar one becomes with the varying course of chronic tuberculosis the easier it is to realize the difficulty of setting forth any positive evidence as to the favorable influence *per se* of any specific treatment, when so many other factors influence the course of a disease in itself so erratic and varying in its manifestations." The results of inoculation treatment of other diseases should be weighed with a similar keen appreciation of the obstacles in the way of final judgment, and I think I am justified in saying that at present correct final estimation of the real value of therapeutic inoculation of dead bacteria is not possible because as yet mostly isolated cases have been reported, often, it is true, of quite marvelous cures, but as the diseases concerned are largely spontaneously curable a body of reliable statistics and much personal experience must accumulate before final conclusions may be drawn.

VIRULENT PNEUMOCOCCI, OPSONIN AND PHAGOCYTOSIS.*

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The mechanism by which the human body combats pneumococcus infections in pneumonia is still very obscure. The blood serum, before, during or after crisis, possesses no bactericidal properties. However much it may seem that opsonification and phagocytosis are primarily responsible for the destruction of the pneumococcus, there are some serious objections in the way of this explanation.

That lobar pneumonia is no longer to be looked upon as a local disease of the lung but as a general infection instead, is the result of recent blood cultures. The pneumococcus has been found in the blood in a large number of cases by Prochaska, Fraenkel and others and in 85 per cent. of 300 cases examined by myself. Shortly before, during and after crisis, blood cultures are apt to be negative. Wolf[1] has shown that pneumococci may be present in the blood after crisis and hence crisis should not be looked upon necessarily as being due to death of the pneumococci in the blood.

The pneumococci isolated from the blood in pneumonia resist phagocytosis in normal and pneumonic serum, while those isolated from

* Read in Symposium on Opsonins before meeting of Chicago Medical Society, Oct. 30, 1907. For discussion see page 89.

1. Journal Infectious Diseases, vol. iii, 1906, 446.

the sputum are not only more readily taken up, but, as Graham has found (*Loc. cit.*), show a lower grade of virulence. From these observations it would seem, therefore, that only those pneumococci of such virulence as to resist opsonification and phagocytosis gain entrance into the general circulation.

In a previous paper[2] it has been shown that non-virulent pneumococci not only remove opsonins from serum because phagocytable, but are destroyed within the leucocyte as well, so that a leucocytic blood has a pneumococcidal action which is directly proportionate to the number of living leucocytes present. On the other hand, highly virulent strains do not remove opsonins from serum and resist opsonification and phagocytosis completely in both normal and pneumonic serum. Thus it would seem that the virulent pneumococci, which are primarily responsible for the blood infection in pneumonia, are not rendered more susceptible to phagocytosis by opsonins. The objection that fifteen to thirty minutes' exposure to opsonins in the ordinary experiment is not long enough for the opsonins to act is not applicable because strains of pneumococci of a grade of virulence so as to just resist phagocytosis are not rendered phagocytable by forty-eight hours' contact with highly opsonic serum. Cultivation of virulent pneumococci in opsonic serum or blood rather preserves virulence and resistance to phagocytosis than otherwise, while cultivation upon blood-free artificial media rapidly renders a virulent strain susceptible to phagocytosis.

The susceptibility to opsonin and the power to absorb opsonin from opsonic serum of one and the same pneumococcus may be increased or diminished at will by passage through rabbits and artificial cultivation (Tables 1 and 2).

TABLE 1.

INCREASE IN SUSCEPTIBILITY TO PHAGOCYTOSIS AND IN POWER TO ABSORB OPSONIN OF PNEUMOCOCCUS 240 ON CULTIVATION UPON ARTIFICIAL MEDIA.

Days upon Artificial Media.	Susceptibility to Phagocytosis of Washed Pneumococcus 240 after Experiment.	Susceptibility to Phagocytosis of Culture Used to Deopsonize Serum before Absorption Experiment.	PHAGOCYTOSIS (20 MINUTES). Normal Serum.	Treated Serum.
1	0	0	12	10.5
9	2.3	+	10	6.0
14	6.3	++	6.0	3.0
23	10.0	+++	18	4.0

TABLE 2.

SUSCEPTIBILITY TO PHAGOCYTOSIS AND POWER TO ABSORB OPSONIN OF PNEUMOCOCCUS 237 AS AFFECTED BY PASSAGE THROUGH RABBITS.

Pneumococcal Strain Used to Absorb Opsonin.	Days upon Artificial Media.	Susceptibility to Phagocytosis.	PHAGOCYTOSIS (20 MINUTES). Untreated Serum.	Treated Serum.
237	2	0	—	—
237 IV	8	+	4.5	0.6
237 VIII	2	0	6.0	4.6
237 IX	2	0	28.0	24.0
237 XI	10	+	10.0	1.5
237 XIII	2	0	6.0	4.0
237 XVIII	2	0	15.0	11.4

The Roman numerals after 237 indicate the number of rabbits through which the pneumococcus has been passed at the time of each experiment.

2. Journal of Infectious Diseases, vol. III, 1906, 683.

This fact, together with the increased pneumococco-opsonic index at the time of crisis, as Wolf[3] and others have shown, seems good proof that opsonification and phagocytosis play an important rôle in combating the pneumococcus infection in pneumonia. But that this mechanism is probably not the primary factor seems equally likely, as will be shown subsequently.

The interesting relation which seems to exist between virulence of pneumococci and opsonification and phagocytosis is further shown by the results of a series of experiments which consisted in the simultaneous intraperitoneal inoculation of guinea-pigs and rabbits with virulent and non-virulent pneumococci and the subsequent study of the peritoneal exudate and blood. The non-virulent pneumococci were taken up promptly by leucocytes and endothelial cells so that at the end of eighteen hours the pneumococci and nearly all the leucocytes had disappeared, while in the animals receiving the virulent injections there was scarcely any evidence of phagocytosis and the pneumococci progressively increased with death. Blood cultures of the former remained negative throughout, while the latter were positive soon after inoculation. Phagocytosis and intraphagocytic destruction seemed to be the method by which the non-virulent pneumococci are gotten rid of, but failed to influence the infection where virulent pneumococci are used.

TABLE 3.

EFFECT OF EXTRACTS OF VIRULENT AND AVIRULENT PNEUMOCOCCI UPON OPSONIC SERUM. Equal parts of extract or NaCl and serum were incubated at 37° C. for one hour when equal volumes of washed blood and pneumococcal suspension were added.

Mixtures.	Phagocytosis (20 Minutes).
Virulent extract	0.13
Avirulent extract	4.6
NaCl solution	6.0

What determines the virulency of pneumococci? Are pneumococci virulent because they resist opsonification and phagocytosis or is this interesting relation a mere coincidence? Upon what does this remarkable difference in the behavior of virulent and avirulent pneumococci depend?

In order to investigate more closely the mechanism whereby virulent pneumococci defend themselves against opsonin and phagocytosis, I undertook, in accord with Dr. Hektoen's suggestion, a study of the action of pneumococcal extracts upon opsonic serum. Highly virulent and avirulent pneumococci were suspended in m/8 NaCl solution and placed at 37° C. for forty-eight hours. The clear fluid drawn off after thorough centrifugalization was then tested as to its action upon opsonin (Table 3). The result is quite striking. The extract from the virulent pneumococci inhibits phagocytosis almost completely, whereas the avirulent extract does so in much less degree.

Similar results have been obtained with many extracts representing ten strains of virulent pneumococci obtained from the blood of pneumonia patients and from post-pneumonia empyema. The extracts of five strains of non-virulent pneumococci, cultivated upon artificial media

3. Journal Infectious Disease, vol. iii, 1906, 731.

for from four weeks to four and one-half years, have given only a moderate antiopsonic effect.

The extracts are now prepared from pneumococci grown upon large blood-agar slants or in glucose-free broth to which 1 per cent. dextrose is added. This broth is prepared from beef and subjected to fractional sterilization. The reaction is 1 per cent. acid to phenolphthalein. Virulent pneumococci grow more abundantly and more rapidly in this medium that in the ordinary broth made from beef extract and sterilized in the autoclave. The addition of one volume of sterile blood to eight or ten volumes of broth not only makes the cocci grow better but they also yield a stronger extract.

TABLE 4.

THE SPECIFIC ANTIOPSONIC ACTION OF EXTRACTS OF VIRULENT PNEUMOCOCCUS.

Mixtures of Pneumococcal extract and Serum or NaCl Solution at 37° C. for 1 hour before adding Washed Blood and Bacterial Suspension.	Phagocytosis (20 Minutes). Pneumococcus.	Streptococcus.	Staphylococcus.
Serum 0.1 + pneumococcal extract 0.1	0.1	7.0	10.3
Serum 0.05 + pneumococcal extract 0.15	0	3.3	9.8
Serum 0.025 + pneumococcal extract 0.175	0	1.5	5.0
Serum 0.1 + NaCl 0.1	6.0	10.6	12.0
Serum 0.05 + NaCl 0.15	5.0	6.0	10.7
Serum 0.025 + NaCl 0.175	3.2	3.0	6.0

TABLE 5.

EFFECT OF VIRULENT PNEUMOCOCCUS EXTRACT UPON AVIRULENT PNEUMOCOCCI.

Equal numbers of avirulent pneumococci suspended 24 hours in the same amounts of virulent extract and NaCl sol. The cocci washed and phagocytability determined.

Extract	pneumococci + normal serum + washed blood *aa*	2.0
NaCl	pneumococci + normal serum + washed blood *aa*	25.0
Extract	pneumococci + serum + NaCl *aa* + washed blood *aa*	6.0
NaCl	pneumococci + serum + NaCl *aa* + washed blood *aa*	30.0

TABLE 6.

EFFECT OF AVIRULENT PNEUMOCOCCI ON PNEUMOCOCCAL EXTRACTS.

Avirulent pneumococci suspended in virulent extract 24 hours at 37° C. and then removed by filtration. The antiopsonic effect of the extract so treated compared with untreated extract:

Mixtures.				Phagocytosis (20 Minutes.)
Treated	extract 0.15	+ serum 0.05		2.4
Untreated	extract 0.15	+ serum 0.05		0
Treated	extract 1	+ serum 0.15		4
Untreated	extract 1	+ serum 0.1		0.2
NaCl solution	1	+ serum 0.1		5.0

In order to get active extracts it is necessarw to suspend rather large quantities of pneumococci in relatively small amounts of salt solution. The pneumococci in about 60 c.c. of broth after forty-eight hours' growth are suspended in 4 to 5 c.c. of normal salt solution and kept at 37° C. for forty-eight hours, heated to 60° C. for one hour, the pneumococci centrifugated down and the supernatant clear fluid drawn off.

The conclusion seems warranted that the extract contains some substance or substances which bind or neutralize the opsonin in the serum, because active extracts do not inhibit phagocytosis by washed leucocytes of previously sensitized pneumococci. Furthermore, the antiopsonic effect of virulent pneumococcal extracts is largely specific for pneumococci, as Table 4 shows the extract does not prevent the phagocytosis of streptococci and staphylococci. After being treated in the manner described virulent pneumococci appear to become phagocytable. It must be remembered, however, that there are difficulties in the way of a clear demonstration on this point, because thoroughly extracted or autolyzed

organisms are so disintegrated and stain so poorly that they are hard to see. However, if extracted organisms do become phagocytable they should absorb opsonin from serum, and, if large enough quantities are added, the pneumococco-opsonin should be removed entirely; and it has been found that when equal quantities of highly virulent pneumococci, extracted and unextracted, are suspended for twenty-four hours in equal amounts of serum, the extracted remove all the opsonin while the unextracted diminish only slightly the opsonic power. Unfortunately it is impossible to carry out experiments with respect to the animal virulence of the extracted pneumococci, because extraction as carried out is associated with death of the cells.

When avirulent pneumococci are suspended for twenty-four hours in virulent pneumococcal extract and then washed rapidly in salt solution they become relatively insusceptible to phagocytosis (Table 5) at the same time as the extract employed loses its power to neutralize opsonin (Table 6) and also becomes less toxic. This interesting result awakened the idea that possibly the induced resistance to phagocytosis brings with it restoration of virulence. To test this possibility by experiment there was injected into the peritoneal cavity of each of three guinea-pigs of nearly the same weight the twenty-four-hour surface growth of two blood-agar slants (approximately 20 sq. cm.) after treatment of the pneumococci (avirulent 233) in each case as follows: (1) Guinea-pig No. 1 received the pneumococci in 3 c.c. of NaCl solution in which they had been suspended for twenty-four hours. (2) Guinea-pig No. 2 received the pneumococci in 3 c.c. of virulent pneumococcal extract in which they had been suspended for twenty-four hours. (3) Guinea-pig No. 3 received the pneumococci after they had been suspended for twenty-four hours in virulent pneumococcal extract and then washed rapidly. The results of the detailed study of the subsequent phenomena are shown in Table 7.

The results of the examination of the peritoneal fluid and blood cultures before and after death leave no doubt that death in guinea-pigs Nos. 2 and 3 was the result of pneumococcal growth, and this growth appears to have been made possible through the acquirement of virulence by the previous treatment of the cocci in the extract. The rapidity with which the leucocytes disposed of the untreated pneumococci is especially noteworthy. No free pneumococci were found at the end of six hours, notwithstanding that such a large quantity was inoculated. In the case of treated pneumococci the results were diametrically different. The endothelial cells, which were very numerous at the end of twenty-four hours in the peritoneal fluid, showed marked phagocytosis of polymorphonuclear leucocytes in guinea-pig No. 1 and of pneumococci in guinea-pigs Nos. 2 and 3. It seems that the endothelial cells which appear later take up pneumococci of a higher grade of virulence than the leucocytes, for at this time the latter show no phagocytosis, even though pneumococci are present in abundance. Results similar to these have been obtained in rabbits as well as guinea-pigs with four other strains of avirulent pneumococci which had been cultivated for three, seven, eight and fifteen months respectively. The animals receiving the pneumococci

in virulent extract always showed the greater reaction, and death occurred earlier in them than in the animals which received pneumococci that had been washed after treatment in extract. That this in a measure is the result of toxic effect of the extract itself is probable, because by itself the extract is not without toxic action. It is likely also that by washing in salt solution pneumococci treated with extract a certain amount of the active substance is again extracted. Subsequent generations of the pneumococci isolated from the blood of the dead animals have virulence which increases as usual on animal passage.

TABLE 7.

THE CONFERENCE OF VIRULENCE UPON AVIRULENT PNEUMOCOCCI BY TREATMENT IN EXTRACTS OF VIRULENT PNEUMOCOCCI.

Intraperitoneal inoculation of same quantity of avirulent pneumococcus after treatment for 24 hours in 3 c.c. of NaCl solution and in 3 c.c. of virulent extract.

	Guinea-pig 1 (320 grams) Pneumococci in Salt Solution.	Guinea-pig (325 grams). Pneumococci in Untreated Extract.	Guinea-pig 3 (340 grams) Pneumococci in Untreated Extract Washed and Suspended in 3 c.c. NaCl Solution.
4½ hours.	Many leucocytes; phagocytosis of pneumococci marked; few free pneumococci; no endothelial cells.	Few leucocytes, many pneumococci; some phagocytosis. Seems in great pain.	Few leucocytes, some phagocytosis; no endothelial cells.
6 hours.	Many leucocytes, no free pneumococci; slight phagocytosis.	More leucocytes, many pneumococci; considerable phagocytosis; seems ill.	Leucocytes abundant; many pneumococci; some phagocytosis.
24 hours.	Leucocytes fairly abundant; many endothelial cells digesting leucocytes; as many as four per cell. Blood culture, negative. Seems perfectly well. Weight 310 gms.	Many leucocytes; some endothelial cells, phagocytosis of pneumococci but not leucocytes; free pneumococci abundant. Blood culture positive. Crouched, very ill. Weight 275 gms.	Very many leucocytes, phagocytic endothelial cells, phagocytosis for pneumococci but not for leucocytes. Blood culture positive.
48 hours.	Leucocytes and endothelial cells few. Entirely well. Blood culture negative.	Leucocytes many; show no phagocytosis; phagocytosis of pneumococci and leucocytes by endothelial cells; free pneumococci present. Weight 240 gms. Very ill.	Less phagocytosis of pneumococci by endothelial cells; free pneumococci present. Weight 275 gms. Very ill.
72 hours.	Entirely well. Weight 320 gms.	Death. Heart's blood—pure culture of pneumococci. Serofibrinous peritonitis.	Still very ill.
96 hours	.....	.....	Death. Findings as in Pig 2.

The minute study of the antiopsonic body in pneumococcal extracts is now in progress. It may be stated that it resists boiling for two minutes and that it does not appear soluble in alcohol or ether. To what extent, if any, it may be associated with the capsular substance of the pneumococci has not been determined. On morphological grounds there seems little reason to associate virulence of the pneumococci with the capsule because it presents the same general appearance in virulent as in avirulent strains.

The chief points may be summarized as follows: It has been found possible to extract from virulent pneumococci which themselves originally do not take up pneumococco-opsonin a substance which neutralizes the opsonin in human serum; this substance unites with avirulent pneumococci and by so doing it confers upon them a degree of resistance to phagocytosis as well as of animal virulence. In other words, it seems

possible to extract from virulent pneumococci the substance upon which virulence would seem to depend, and at present the name "virulin," suggested by Dr. Hektoen, seems quite appropriate. While the action of "virulin" may be subject to several hypothetical explanations, at present it is probably best to look upon it simply as a substance or mixture of substances which when united with the pneumococcal cell prevent this from taking up opsonin, and which when free has special affinity for opsonin. That it does not merely concern free opsinophile cell receptors seems likely, for one reason because virulent pneumococci when extracted, i. e., freed from virulence, are found to absorb pneumococco-opsonin freely.

CONCLUSIONS.

Avirulent pneumococci absorb opsonin and become susceptible to phagocytosis; virulent pneumococci do not absorb opsonin and are insusceptible to phagocytosis; and these properties may be diminished or increased at will by passage through rabbits or cultivation on artificial media as the case may be.

Extraction or autolysis of virulent pneumococci in NaCl solution brings into the solution a substance or group of substances which inhibits the action of pneumococco-opsonin; avirulent pneumococci take up this substance and now become not only resistant to phagocytosis but exhibit also to some degree the property of animal virulence; after extraction of the substance virulent pneumococci acquire the power to absorb pneumococco-opsonin.

From the evidence at hand, it would seem, therefore, that opsonification and phagocytosis play a secondary and not a primary rôle in combating the pneumococcus infection in pneumonia, because, as here shown, virulent pneumococci must be previously altered before they will absorb opsonin and become phagocytable.

BACTERIAL VACCINE THERAPY IN TUBERCULOSIS.*

MARY C. LINCOLN, M.D.

Private Laboratory Dr. L. L. McArthur and Dr. J. C. Hollister, St. Luke's Hospital, CHICAGO.

It is our purpose to submit to you this evening the report of a year's work on Bacterial Vaccine Therapy carried on in the private laboratory of Dr. L. L. McArthur and Dr. J. C. Hollister at St. Luke's Hospital. The laboratory work was done by Drs. Vail, Lincoln, Hagans, Line, Miss Maloney, Miss Dunlap and Miss Euans. There must of necessity be much repetition of our recent written report published in the October number of the *Journal of Surgery, Gynecology and Obstetrics*, but it is by the consideration and the discussion of the results of different investigators that the real value of a work and its truth can be established. The primary object of the laboratory was to determine the therapeutic value of bacterial vaccines and the value of the opsonic index as a guide in their administration. Many of the problems we have

* Read in Symposium on Opsonins before meeting of Chicago Medical Society, Oct. 30, 1907. For discussion see page 89.

taken up have been verified not only in the different departments of our laboratory, but in many other laboratories.

From the department of tuberculosis I wish to give brief statements of data and conclusions arrived at from tuberculin treatment as guided by the opsonic index.

THE OPSONIC INDEX AS A GUIDE IN THE ADMINISTRATION OF (TUBERCLE) VACCINE.

A total of 2,500 tuberculo-opsonic index estimations have been made on 180 individuals, of whom 40 were cases treated, 35 for diagnosis and 105 were normals. A study of the record cards of the patients treated with tuberculin will show that there is no marked variation among the patients as to the time and degree of opsonic reaction; in other words, that each patient is not a law unto himself as to the average number of days between injections, the average highest opsonic index after injections, nor as to the average opsonic index previous to each injection. Hence we may determine the following averages:

1. The average number of days between injections was 7.
2. The average of the highest opsonic indices was 1.3.
3. The highest opsonic index occurred on the average between the third and fourth day.
4. The average of the opsonic indices previous to each injection was 1.0.

Such a comparison has a certain value in establishing a standard upon which to base the vaccine therapy, but taken alone it will give an erroneous idea of uniformity of treatment of patients. While there is a tendency toward similarity in reaction and in the time of the vaccine injection during the course of the treatment of a patient and of the different patients, there is too much variation to warrant dependence on any such standard. This is brought out in a striking way in a table showing the extremes of intervals between injections.

From our examinations of opsonic indices we have found it impossible to establish a standard interval between injections. We can, however, conclude from our data that it is possible to maintain the index at or above normal, if the vaccine is given when the opsonic index has dropped on the average to 1.0. That is not our only guide. The degree of reaction, that is, what the maximum index was, how soon it appeared after the injection, and whether there was a gradual or a sudden drop to normal or below, are additional aids in determining the dosage and the time of administering the vaccine.

CONCLUSIONS TO BE DRAWN FROM CHART CURVES OF OPSONIC INDICES.

The charts of curves of each opsonic index demonstrate the following points:

1. There is, with very few exceptions, a rise in the opsonic index after each injection of vaccine.
2. With one exception, there are no two successive maximal rises in the opsonic index after the injections.

3. There is a tendency toward a monthly maximal opsonic index.

The charts of the curves of the weekly average opsonic index accentuate some of the features merely indicated in the daily curves.

1. There is a step-like rise of the index to the second and third month, when the maximum is reached, to be followed by a drop to a lower average maintained above normal.

2. There is an individuality about chart curves as to the maximum index.

3. There are classes of cases that show a rapid rise to the maximum index.

4. There are classes of cases that show a low maximum and small range of the opsonic index.

VALUE OF THE OPSONIC INDEX IN DIAGNOSIS.

In a total of 350 opsonic indices of normal individuals the range of the indices, with very few exceptions, was 0.8 to 1.2. On the other hand, the average of the opsonic indices of 40 patients before treatment was found to be 0.68 and the range from 0.3 to 0.9. Of 75 cases examined, 40 being cases treated and 35 for diagnosis, there were 4 cases whose clinical diagnosis and opsonic index diagnosis did not agree. We have then a normal tuberculo-opsonic index; we have found our tubercular patients to have an average opsonic index before treatment below normal, and we have found that 95 per cent. of the opsonic index diagnoses agreed with the clinical diagnosis.

I wish to emphasize the fact that a single examination of the opsonic index is of very little value. A series of positive indices, e. g., with an average below normal, is of positive significance; a series of negative indices, e. g., within the normal range, does not necessarily mean there is no tubercular infection.

THE TUBERCULO-OPSONIC INDEX TO THE HUMAN VS. THE BOVINE TUBERCLE BACILLUS.

The question of the infection of patients with bovine tubercle bacillus came up in one of our cases of tubercular peritonitis. The patient was a colored girl 13 years old. An exploratory operation confirmed the diagnosis of general peritoneal tuberculosis. The tuberculo-opsonic index to the human tubercle bacillus was persistently normal in this case, but to the bovine was below normal. In the treatment a vaccine of the human tubercle bacillus was used in the hope of raising the index. From a study of the curve of the opsonic reaction chart it will be seen that the index to both the human and bovine tubercle bacillus rose after each injection, but that the curve of the human does not correspond exactly with the curve of the bovine. In other words, the index to the human tubercle bacillus is not always high on the same day as that of the bovine. It would appear, then, that the vaccines of closely related micro-organisms can stimulate the formation of opsonins to these different micro-organisms.

To learn whether the tuberculo-opsonic index to the human and bovine tubercle bacilli did or did not correspond in other patients, examinations were made comparing at the same time the index to the human and the bovine. It was found that where the tuberculo-opsonic index to the human tubercle bacillus was below or above normal the tuberculo-opsonic index to the bovine tubercle bacillus was normal.

LABORATORY TECHNIC AND ITS RELIABILITY IN OPSONIC INDEX DETERMINATIONS.

The question of accurate laboratory technic is of fundamental importance when one considers how much the value of the vaccine therapy depends on the laboratory work. Some of the discrepancies in results from the various laboratories I believe were due to differences in points of technic, especially with reference to the emulsion, the number and distribution of the leucocytes and the standard of counting. It is possible to obtain an emulsion of tubercle bacilli nearly free from bacterial clumps and of sufficient strength. Thorough grinding of the dried bacilli and shaking with salt solution in a shaking machine will very successfully break up the bacterial clumps. After diluting the emulsion to the required strength it can be drawn into small capsules and sterilized. This method of preparing a large quantity of emulsion at one time avoids the necessity of daily preparations and gives one an emulsion of standard strength. Care in the uniformity of smears, in the obtaining of an emulsion of proper strength and a rigid adherence to a standard of counting will give average uniform results in opsonic index determinations by the same and by different individuals.

CONCLUSIONS.

1. There is a normal tuberculo-opsonic index.

2. Of the seventy-five cases examined for diagnosis the clinical and the tuberculo-opsonic index diagnosis agreed in 95 per cent.

3. The opsonic index is a valuable guide in the administration of the tubercle vaccine.

4. In summing up the data obtained by us as to the reliability of the opsonic index determinations there are three striking results that present themselves:

(a) The comparatively small difference in the counts made by different individuals of the same slides.

(b) The small range, e. g., 0.8 to 1.2, of the opsonic index of normals in over 350 examinations. It would seem impossible to obtain such comparatively uniform indices with an unreliable technic.

(c) The generally consistent opsonic indices, e. g., such as one would expect to follow vaccine injections in over 2,000 estimations.

VACCINE THERAPY IN STAPHYLOCOCCUS INFECTIONS.*

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CHICAGO.

The interest centering around the opsonic treatment of acne, furuncles, abscess, etc., leads me to mention first the vaccine, its dosage and administration. Instances have been reported where an initial dose of 1 to 2 cubic centimeters of a two weeks' bouillon culture of staphylococci were given, the following injections being increased by the minim or cubic centimeter and not by the number of organisms. If all staphylococcus stains would grow in precisely the same manner under similar conditions, namely, heat, period of incubation and media, it would be a simple matter to give the vaccine by bulk, but this is not the case. Some growths are luxurious and rapid, while others are thin and slow, and the same strain will not multiply twice exactly alike under similar conditions. Even to the naked eye this fact is plain. I have in mind one strain especially isolated from a case of acne which grew in minute colonies at first and later in very thin streaks on agar and caused only the slightest cloudiness in bouillon after several days' incubation. To make positive the above statements four test tubes, each containing 8 c.c. of bouillon were inoculated on the same day with different strains of staphylococci from Cases *a, b, c* and *d*. Then two more cultures were made from *c* and *d* respectively. The six tubes were then placed in the incubator. At the end of fourteen days each tube was sealed and shaken vigorously for forty minutes to break the clumps of bacteria. Smears of well mixed equal measures of blood and each culture were made and the number of red cells and bacteria in eighty fields counted in each case. Knowing there are 5,000,000 red cells to a cubic millimeter the proportion red cells : bacteria : : 5,000,000 : x is made and the thickness of each culture calculated. The results showed a difference of 3,000,000,000 organisms between the thickest and thinnest of the cultures. Hence if a dose of 2 c.c. of these had been given, there would have been a variation of 6,000,000,000 staphylococci. The difference between the two cultures from Case *c* was only 120,000,000, but in Case *d* the difference was 2,250,000,000 per cubic centimeter, which is twice the average dose. Therefore, to repeat: All strains do not grow with equal rapidity; the same strain does not grow twice alike under similar conditions; an increase in volume does not necessarily mean an increase in dose of unstandardized preparations. Hence to start with a small dose and to increase it when necessary, as with any drug, and to be positive that it is increased when more volume is given, there is but one way to prepare the vaccine and that is to count the organisms.

An initial dose consists of from 500,000,000 to 1,000,000,000 staphylococci, increasing 500,000,000, as indicated by the failure of the index

* Read in Symposium on Opsonins before meeting of Chicago Medical Society, Oct. 30, 1907. For discussion see page 89.

to rise after an injection; 3,000,000,000 is the largest dose given so far. The reaction is slight, in most cases consisting of some local soreness, redness and stiffness lasting from one to three days. Three cases have reported general malaise following injections, but the majority do not complain beyond the local effect, which decreases as the treatment progresses. The site nearest the lesion is selected for inoculation if possible. Between the scapulæ or in the loose tissues of the abdomen are desirable places, but many patients come to the laboratory for treatment, so the arm is often chosen for the sake of convenience.

The acute cases and to begin the treatment of chronic cases a stock vaccine has been used in many instances until an autogenous vaccine could be made. Barring accidents (which are manifold) the bacteria can not be isolated, grown, washed off the media, counted, sterilized and a portion of the finished product planted on agar to prove its sterility within a shorter period than eight or nine days. Thirteen of our cases have received from one to three inoculations of stock vaccine as preliminary treatment, the index going to 1.3 in one case, 1.4 in two, 1.5 in two, 1.6 in two, 1.7 in one and 1.9 in another case, leaving only four instances showing no appreciable rise. Five cases of acute and one of chronic furunculosis have been treated entirely with stock vaccines, three of which received two injections each, with most satisfactory results; the fourth (a dispensary patient) was improving, but failed to report his final condition, and the fifth showed no unusual tendency to a more rapid recovery than under ordinary treatment. The chronic case has just reported the appearance and disappearance of a lesion starting in similar manner to former furuncles, without the formation of pus. At present a case of acne is being treated with a stock vaccine with the purpose of ascertaining whether the clinical results will be as satisfactory as those of cases receiving autogenous vaccines; she has received five injections and the face is considerably clearer.

In mixed infections it is important to isolate the germs and make separate vaccines, which should be given independently of each other, the blood being run through to each organism and treatment administered when indicated by the fall of the index. Two patients have received tubercle, pyocyaneus, colon and staphylococcus vaccines in this manner, and two are receiving tubercle and staphylococcus injections. That the opsonins are specific is easily seen by looking at the charts of these patients showing the different curves. The administration of the vaccine of one organism has no effect upon the opsonins toward the other organism, the index to one bearing no definite and uniform relation to that of the other; one may be high and the other low on the same day, or again there may be a simultaneous rise of all the indices.

I wish to conclude by saying that Dr. Lincoln, Dr. Vail and myself desire to jointly thank Dr. McArthur and Dr. Hollister for making it possible to carry on this work and to express our appreciation of their encouragement toward independent investigation.

BACTERIAL VACCINE THERAPY IN GONORRHEA.*

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CHICAGO.

It is my purpose to discuss:

1. A few points of technic used in determining gonococco-opsonic index.

2. The making of gonococcus vaccine.

3. The normal and the pathological gonococco-opsonic index, and the relation between the phagocytic index and Wright's bacillary index.

ISOLATION AND CULTIVATION OF THE GONOCOCCUS.

The isolation of the gonococcus is the first difficulty which confronts the laboratory worker. Although the diagnosis of a gonorrheal infection may be positive, the gonococco-opsonic index low, and smears show many intracellular bean-shaped, gram negative diplococci, nevertheless a dozen or more tubes of media may be inoculated with the gonorrheal discharge in question and no growth be obtained. The very fact that there is no growth, when we know there are many diplococci present, clinches our diagnosis but interferes seriously with our object in view, viz., the preparation of an autogenous vaccine. I have found the most satisfactory media to be, 1, ascitic agar; 2, human blood agar. The gonococcus grows equally well on either, the advantage of the latter being that it is always available, while at times the demand for ascitic fluid seems to far exceed the supply. After isolating the gonococcus transplantation every twelve to twenty-four hours, although not necessary to its existence, greatly aids in maintaining its luxuriant growth and in avoiding involution forms, and a deposition of extra cellular substance, which renders it difficult to break up clumps, and interferes with clear staining.

Gonococci grow well at 37.5 C., but at 39° they grow larger and with much less clumping.

THE EMULSION.

The tendency of gonococci to clump has been a serious drawback in the preparation of the emulsion and in counting the vaccine, but some strains which show a vicious obstinancy to clump lose this characteristic when grown at 39 C. In preparing a quantity of emulsion a twelve to twenty hours' growth on ascitic or blood agar is removed into a small test tube of sterile 1.5 salt solution, the tube sealed and shaken in the shaking machine for one-half to three-quarters of an hour. This suspension, which contains practically no clumps, is then diluted to any desired strength and placed in sterile capsules, such as Dr. Lincoln

* Read in Symposium on Opsonins before meeting of Chicago Medical Society, Oct. 30, 1907. For discussion see page 89.

has used in her tbc. work. These capsules are then placed in the refrigerator, at which temperature the G. C. does in twenty-four to forty-eight hours. The low temperature does not diminish the staining power, while sterilizing at 60° C. for an hour markedly interferes with clear staining. In my daily work I have used an emulsion of a strength giving a bacterial average between 1 and 2 gonococci per leucocyte.

RUNNING THROUGH.

I have found that seven minutes, as used in Wright's laboratory, is the most desirable period of incubation for the following reasons: It gives a minimum amount of time for the cocci to agglutinate, and for the leucocytes to take up clumps; and for the emulsion to settle, which it has a marked tendency to do. The bacterial average rarely varies over .3 or .4 when the same serum is run through twice with an interval of seven minutes; with an interval of twenty minutes, the range may vary from .5 to .8 of a point. It is therefore advisable that the interval between running through the pool and the patient's blood be not longer than seven or eight minutes.

The importance of making similar smears is obvious. In counting, the personal equative is necessarily an important factor—the person who counts the patient's slide should of course count the pool—but I should like to mention here that in independently counting series of slides numbered by a third person Miss Euans and I, with only an occasional exception, obtained bacterial averages varying only from .2 to .4.

GONOCOCCUS VACCINE.

In the preparation of the vaccine one tube of ascitic bouillon or human blood bouillon is inoculated with gonococci and incubated forty-eight hours. From this growth one-half dozen large test tubes of ascitic or blood agar are inoculated by pouring about ½ c.c. into each tube and allowing the bouillon to slowly flow over the surface. These are incubated twenty-four to thirty-six hours. Then to each is added enough normal salt to facilitate removal of the growth. The growth may be so adherent as to require the aid of the platinum needle in removal. For this reason test tubes are used instead of flasks as in the preparation of staphylococcus vaccine. The suspension is then poured from each tube of agar into one large sterile test tube, which is sealed and shaken in the shaking machine for about three-quarters of an hour. A portion is then removed for standardizing, according to Wright's method, the tube resealed and sterilized by placing in water at 58° C. for an hour.

DOSAGE.

Ten million to 15,000,000 is the average dose we have used in adults, 4,000,000 to 10,000,000 in children, 2,500,000 the minimum dose, 20,000,000 the maximum dose.

We now come to the discussion of the normal and the pathological indices and the relation between Wright's bacillary index and Simon's percentage index, which we have called the phagocytic index. I do not wish to take up your time with long tables and charts, but will briefly present to you the following conclusions, drawn from eight months' work with the gonococcus:

1. In 300 determinations the gonococco-opsonic index in normal individuals ranged from .8 to 1.2 with only eighteen exceptions.

2. In one determination each of fifty-one different normal individuals the opsonic index ranged from .8 to 1.2 with only two exceptions, one being .7, another 1.4.

3. In twenty-seven patients examined from two to ten times each the diagnosis was positive in 89 per cent. Therefore, a normal index does not rule out gonorrhea, but no patient showed a consistently low index in whom the gonococcus was not identified.

4. The chronic cases show a tendency to run a lower index than the acute cases, in the majority of cases .8 or below. (In the thirteen chronic cases examined 70 per cent. gave an opsonic index below .8, 30 per cent. .8 or above. In the eighteen acute cases 37½ per cent. were below .8, 62½ per cent. .8 or above.) Case 32 showed a decided exception to this tendency. The case was diagnosed clinically chronic gonorrhea, but the first index was found to be 2.4. The following day gave an opsonic index of .6. Then no blood was received for five days, when word came that the patient was running a temperature of 104° and too ill to be disturbed to take the blood. Clinical diagnosis, gonorrheal pyelonephritis. The auto-infection of the patient showed, therefore, in the blood five days before it was discernible clinically. Case 25 also showed an index illustrating an auto-inoculation. The case was diagnosed clinically gonorrheal arthritis; gonococci were identified in the profuse urethral discharge. May 15, 16 and 18 gave the indices .6, .8, .9. On the 20th I found the index to be 2.0 and learned that on the 19th the knee joint had been opened and drained.

5. The phagocytic index runs closely parallel to the bacillary index in normal individuals. This is true in gonorrheal patients before vaccine treatment is begun.

6. After thirty-six injections the phagocytic and bacillary indices reached their highest points on the same day in 94½ per cent.

7. The average highest phagocytic index is lower than the average highest bacillary index.

8. The phagocytic index tends to fall earlier than the bacillary index. Therefore the phagocytic index, although it may tell us when to repeat the vaccine, does not guide us so well in determining the size of the dosage.

9. In a series of fifty-two gonococcus vaccine injections only two were followed by negative phases in the opsonic index. I have seen no clinical negative phases.

10. We cannot yet draw clinical conclusions from the results of gonococcus vaccine.

The majority of the patients treated were from the Alexian Brothers Hospital, and I wish to thank Dr. Louis Schmidt for his assistance in making it possible to study the blood of these patients. All were improved and some cured, but besides the vaccine treatment they received the routine hospital gonorrheal treatment. Two cases of vulvo vaginitis in children have received the vaccine treatment alone. One child had received other treatment for a month before coming to us, the discharge showing no decrease. After one injection the discharge was markedly diminished, and after the second, given May 25, there has been no visible discharge. Smears have been made after each injection every ten days to three weeks. Two successive examinations may show no gonococci and the next smear show a few grams negative diplococci.

You may be interested to see the method we use in shaking our vaccines and emulsions. With the assistance of Mr. C. F. Adams I designed this instrument, which promises to save time and energy as well as give more satisfactory results. The machine runs with about 1,200 vibrations per minute, and the holder now contains a sealed test tube of vaccine ready for shaking and a capsule of tubercle emulsion.

CLINICAL RESULTS AND CONCLUSIONS.*

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As an introduction to some clinical conclusions we would like. if you please, to report three cases representing three different types as follows:

1. Chronic staphylococcus infections, clinically characterized by boils, furuncles, glandular abscesses, nail infections, etc.
2. Localized tuberculosis complicated by secondary infections.
3. Chronic generalized tuberculosis.

These are picked cases, so to speak, and illustrate clinical results obtained by vaccine therapy so definitely that there is no doubt but that the conclusion must be made that the result was due to the treatment. We all know only too well how many factors and conditions and sources of error there are between cause and effect, between treatment and cure, and especially must care be taken not to be hasty and superficial in drawing conclusions when we are dealing with a comparatively new line of procedure.

The first case gives the following history:

Woman of about 33 years of age. Has had some twelve or thirteen boils in right axilla covering a period of eighteen months. Many smaller furuncles and boils on arms, breast, navel, left ear—in fact has not been free from some such

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* Read in Symposium on Opsonins before meeting of Chicago Medical Society, Oct. 30, 1907. For discussion see page 89.

manifestation for one and one-half years. Nail infection some months ago of index finger. Examination at beginning of vaccine treatment disclosed: (a) Small inflamed tender swelling in right axilla. (b) Suppuration under and about root of nail of ring finger of the left hand.

Injections began August 19, as shown by the chart. During the next 12 or 15 days three boils developed in axilla and on arm. These disappeared much more quickly than usual and no evidence of localized infection has appeared since, i. e. for a period of two months. She has had six injections of staphylococcus vaccine, four of which were from an autogenous culture. The index was low before injections, .6, and has been kept up to normal or above ever since.

The second case is one the incomplete record of which has been given for publication before. She has been under Dr. McArthur's care for many years:

A woman, aged 33, who, for tuberculosis of the left kidney and ureter, has undergone a nephrectomy, ureterectomy and vesico-vaginal drainage for vesical tuberculosis; later, a right sided nephrotomy and a final drainage of the right ureter through right loin. Intervals of a year or more between operations. When injections were begun in September, 1906, the condition was extremely critical as shown by marked emaciation and weakness, large sacral decubitus, toxic neuritis of both lower extremities. Hope of recovery abandoned. Soon after administration of the vaccine improvement was noted and after remaining in the hospital some seven months, returned to her home. She received besides tuberculin, autogenous vaccines of colon bacillus and staphylococcus, which organisms were found in abundance in the wound discharges.

The condition to-day is as follows: Right kidney drained by tube. Old persistent fistula to left ureteral region still discharging considerable pus. Vesico-vaginal fistula not as yet repaired. Ankylosis of right hip joint. Marked gain in weight and strength. Able to walk down stairs and across the street into a neighboring park. Appetite excellent and mentality very active. There seems to be no doubt but that life was saved in this case.

The third case is that of a young man who has kindly consented to be present at this meeting for your examination and is especially interesting because he has been examined from time to time by three other investigators, whose accurate clinical reports they will themselves give. The patient came to Dr. Dodds for some "eye trouble" (Dr. Dodds will report his findings). The patient was then referred to Dr. Lucius Pardee for skin diagnosis and treatment. Dr. Pardee referred him to us as a case for vaccine therapy, and as there were some lung findings Dr. Keating was asked to make careful note of what pulmonary changes occurred, if any. Drs. Pardee and Keating will also report directly.

Permit me first to give an outline of the history of the case and to speak particularly of the glandular and testiculo-epididymal aspects:

Male, 24 years of age. Carpenter. Has never been well and strong. Some chronic abdominal distention until 13 years of age. A nasal catarrh has persisted for the last few years each winter. The skin eruption began in January, 1907; soon after the eye symptoms appeared. Examination early in April, 1907, disclosed besides the eye and skin condition a marked enlargement of both parotid gland regions. The right side, size of small egg, was very hard and slightly nodular, giving a sensation of grating to the touch. The left side was also hard and somewhat smaller; no tenderness, no pain, slightly movable. Objectively

it was difficult to decide whether the parotid glands themselves or the parotid clusters of lymphatics were involved in a neoplasm or inflammatory condition. Other smaller glandular swellings could be felt along the sterno-cleido-mastoid of the right side.

June 19, 1907: Parotid swelling distinctly reduced in size. Attention was called by patient to a swelling in the scrotum. Examination revealed: Right testicle swollen considerably, right epididymis, upper pole very hard and swollen; lower pole very hard and nodular; cord is nodular; left testicle of normal size. Left epididymis very hard and nodular but not so large as right; no pain, no tenderness, probably has existed for some time.

July 5: Parotids very much smaller; small cluster in submaxillary region smaller. Both epididymes seem somewhat less hard; right a little tender.

July 30: Testicles appear normal in size. Right epididymis lower pole soft but still thick. Left side just palpable, no tenderness.

September 3: Parotid region negative; in submaxillary region glands still palpable. Right epididymis, nodule upper pole, separate, size of pea, a similar nodule over lower pole, no tenderness. Left side, smaller nodule upper pole which is tender, lower pole negative.

September 16: Patient reports not feeling so well; thinks he has had temperature at night and a persistent nasal catarrh. Advised to stop work and record temperature and crowd diet.

October 14: Temperature of 99 2/5 is highest recorded in two weeks, one of 99 1/5 and one of 99°, all other evenings normal. Parotids normal. Small mass under angle of jaw as before. Right epididymis showed bean-sized soft mass at upper pole, smaller mass lower pole.

October 30: Glands in neck and parotid regions scarcely palpable. Scrotum, right side, soft thickening at upper pole, and same but smaller at lower pole. The former hardness has entirely disappeared. Left side, nothing to be felt at upper pole, thickening only over lower pole, quite a cluster of veins up the cord.

As a summary, then, we may say that in a case of glanular and epididymal tuberculosis (diagnosis confirmed by chest findings and histological examination of the skin lesions) marked improvement in both conditions has occurred synchronously with the administration of tuberculin. I will ask the others to give their clinical data of the case at this point.

Dr. Emmet Keating:—This case was referred to me by Dr. Pardee, who made a diagnosis of tuberculosis of the skin. I obtained the following history:

April 2, 1907. Mr. M., Swede; aged 24; single; carpenter. Complains of cough; chest feels sore; tires easily. Becomes dizzy and dyspneic when he climbs stairs or exerts himself unusually. Has pain in the stomach. Has photophobia, which he states has existed for two months. Pain in right ear; feeling of soreness when finger is introduced into canal. He does not sleep well. Coughs and expectorates during the night. About a tablespoonful of yellowish material is expectorated in twenty-four hours. Has had nasal and throat catarrh for six years. There is an uncertain history of hemoptysis. Four weeks ago had sore throat, which lasted two weeks. He does not remember of having had any of the diseases of childhood, but states that he was delicate and unable to attend school until he was 9 years old. At 13 he again became weak and ill, and was sick for two months. When 18 he suffered acutely from nasal catarrh and cough. Does not use alcohol, and denies venereal infection.

A year ago last December contracted a cold and became too weak to work. Took eggs and milk for a month; gained fifteen pounds and felt entirely well. Usual weight, 158. Thinks he has lost weight since January of this year. Appetite is poor. Bowels regular. Had night sweats six weeks ago; also last winter. Pulse 104, temperature 99.2.

Family History.—Father and mother living and well; ages 52 and 48. Four

brothers and two sisters living and well. Two brothers died at the age of 3, one of scarlet fever, the other cause unknown.

Physical Examination.—The hair is thin and presents a dead, greasy appearance. Right pupil is widely dilated (atropin). The face presents an erythematous blush and is studded with small elevations a little larger than a pinhead. The erythema is more pronounced upon the forehead. Left nostril is occluded by an enlarged inferior turbinate. There is a red line at the margin of the gums. The teeth are straggling and discolored. The tongue is slightly coated. Tonsils are quite small. Posterior wall of pharynx presents a dry, glistening appearance and is studded with a number of small crusts. There is a discrete papular eruption over the entire body. The hands and feet are cold and clammy. Chest: Marked retraction beneath both clavicles. Decreased expansion of left side. Deep inspiration induces cough. Vocal fremitus negative. Right side, anteriorly, dulness extends from apex to lower border of third rib. Bronchial breathing over entire surface of right lung. A few crepitant râles are noted. Posteriorly, dulness extends from apex to inferior angle of scapula. Bronchial breathing from apex to upper border of sixth rib. Pectoriloquy over greater portion of latter area. Friction sounds between third and fifth rib right axillary line. Left side, anteriorly, slight dulness beneath clavicle; breath sounds but slightly altered; blows of percussion hammer beneath clavicles cause pain. Posteriorly there is bronchial breathing between seventh and eighth ribs; friction sounds, left axillary line over fourth rib. Heart: The heart is not enlarged or displaced. The valve sounds are indistinct, the aortic especially so. Abdomen: There is tenderness over entire abdomen, more marked upon right side, and extending upward over area of liver. The urine was not examined. Tubercle bacilli were not found in sputum.

Diagnosis.—Pharyngitis sicca; pulmonary tuberculosis; passive congestion of liver; subacute gastritis; general subacute peritonitis; tuberculosis of skin (Pardee); of conjunctiva (Dodds).

The patient returned for examination of chest Aug. 9, 1907. Weight, 152; pulse, 87; temperature, 99.2. Retraction is noted beneath both clavicles. Vocal fremitus negative. Right side anteriorly, flat percussion note from apex to upper border of second rib; slightly higher note to upper border of third rib; right axillary line high percussion note from axilla, shading into liver dulness below. Anteriorly the inspiratory note is harsh and base in character from apex to lower border of second rib. Below this level inspiration is limited and expiration insufficient in volume. Right axillary line presents same condition as noted anteriorly below second rib. Posteriorly, the percussion note is dull over entire lung area; pronounced bronchial breathing gradually diminishing from apex to lower angle of scapula. Respiratory volume below above point is small. No râles. Left side, anteriorly, percussion note high from apex to upper border of fourth rib. Left axillary line, high percussion note from axilla to base of lung. Posteriorly, flat note from apex to spine of scapula, then dull shading to normal as fourth rib is approached. Anteriorly, auscultation shows inspiratory note that is jerking and whistling in character from apex to third rib; axillary line, both inspiration and expiration, are very indistinct. Posteriorly, slight bronchial breathing from apex to spine of scapula; remaining lung surface, both inspiratory and expiratory sounds are diminished and indistinct. The heart is normal, except for slight tachycardia.

The patient came in to-day, and I find him with a pulse of 84 and a temperature of 99.2; weight, 167. The chest findings are improved; tenderness over abdomen absent; no cough or expectoration. The skin is clear and the patient states that he is feeling good. I consider that this patient has made most excellent progress towards recovery, but do not think that the improvement is more marked than in those cases which receive medicinal treatment. From what we have heard to-night we can readily infer that this form of treatment requires a laboratory force that the general practitioner does not have at his command. With this

in mind, we should not grow lax in our hygienic and medicinal treatment which has accomplished so much.

Dr. Oscar Dodd:—The case to which Dr. Hollister has referred came to me the first of April, complaining of trouble with his eyelids and eyes, which had lasted for two or three months, and had been treated by an oculist for trachoma. Upon examination I found that both lower eyelids were considerably inflamed, with a follicular infiltration, looking very much like trachoma. These were slightly yellowish, with a little ulceration at the upper part of some of them, and considerable secretion. These small points of infiltration extended over the border of the lid and were continuous with the skin lesion, so that I concluded it was of the same nature and advised the patient to see a dermatologist in regard to it. The eye trouble is one which has been described as a mild form of tubercular conjunctivitis. It is quite uncommon, and I should not have been able to have determined it from the clinical picture alone. From the subsequent diagnosis of the skin lesion and its improvement under the tuberculin treatment I concluded it was tubercular.

Dr. Pardee:—This case was referred to me March last by Dr. Dodd for diagnosis of the skin lesions then present. At that time the conditions were as follows: The face was the site of a mixed eruption somewhat eczematous in character but not eczema; nor was it typical of any definite dermatosis, being possibly due to an application the patient had been making before he came to Dr. Dodd for treatment. This disappeared promptly under mild antiphlogistic treatment. Upon the body and limbs, especially upon the extensor surfaces of the arms and legs, were found groups of lesions which were unmistakably those of one of the so-called tuberculides. These lesions were pinhead-sized papules, pinkish red in color, slightly elevated above the skin surface and capped with thin scales. They occurred in groups of from 10 to 15 and were apparently connected with the hair or sweat follicles. Beneath some of the groups of lesions a small nodule could be felt. No subjective symptoms were present. I made the diagnosis of folliclis and referred the patient, with Dr. Dodd's permission, to Dr. Hollister for the vaccination treatment.

Before the treatment was started the patient was exhibited by me before the Chicago Dermatological Society, whose members concurred in the diagnosis. A group of nodules upon the arm was excised and prepared in the usual ways. Sections of this show what are apparently typical tubercles, consisting of giant cells, epithelioid cells, and leucocytes in the usual tubercular arrangement located near the sweat ducts and hair follicles, especially the former. So far no bacilli have been found in the tissues.

One point of interest occurred after the first or second injection of the tuberculin in that each group of lesions became raised as a whole, to a considerable extent above the general skin surface and somewhat reddened and tender. When these symptoms subsided the papules had nearly disappeared, leaving brownish pigmented spots, which are now present on the legs and to a very slight degree on the arms and buttocks. No local treatment or internal medication was given by me during his vaccination course, except placebos and general tonics.

I think you will all agree that there has been cause and effect in the three cases reported.

Now, as to general clinical results: What can we say as true to-day as to the actual value of bacterial vaccine therapy? It seems to me that the following conclusions are quite conservative:

1. Inoculation by autogenous vaccines, if properly administered and regulated as to dose and interval by following the opsonic index, is one of the best—if not the best—methods to-day of curing and preventing the recurrence of chronic staphylococcus infections such as boils, furuncles, etc. Such treatment should never be omitted even if given synchronously with other recognized means of relief.

2. In the treatment of chronic acne, injections of autogenous vaccine of staphylococcus often brings about a cure and in the majority of cases is attended by marked improvement. We have thoroughly treated some five cases. In none of them have we failed to obtain either improvement or cure. One must not forget, of course, that much bacterio-etiological research is necessary under the head of "acne."

3. In chronic localized tuberculosis, such as is illustrated by tuberculous inflammations of bones, joints, urinary tract and glands, the administration of tuberculin as guided by the opsonic index is frequently of distinct value, acting not only as a general tonic but hastening local tissue repair. This we can say in spite of the fact that the ten picked cases of bone and joint tuberculosis selected about a year ago at the Home for Crippled Children do not show to-day distinct definite improvement over ten similar cases under like conditions but who have not had tuberculin. It is yet, of course, too early for us to draw final conclusions in such cases.

4. Judging from the cases reported in literature and from our own rather limited clinical experience in these lines we may say that occasional marked results one may expect in chronic localized infections by the colon bacillus (cystitis, pyelitis, etc.) and by the gonococcus (arthritis).

As a final remark I would like to ask the following question: Are we as surgeons doing as much as we can and should in our cases of surgical infections to build up the immunity strength of our patients, by vaccination, by inoculation, by hyperemia, by injections of horse serum of nucleinic acid and administration of such substances as will increase or decrease the coagulability of the blood?

100 State Street, Chicago.

A NEW MODIFICATION OF THE PRIMARY POSITION IN THE BLOODLESS TREATMENT OF CONGENITAL HIP-JOINT DISLOCATION.*

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Since Paci, in the beginning of the nineties of the last century, called attention to the possibility of treating the congenital hip dislocation merely by manipulations, and Lorenz furnished the proof that this deformity is amenable to a cure by the administration of a clean-cut technic of reposition, the progress of this problem was watched very carefully by the whole profession.

As a direct result of this fact there is a vast and increasing literature dealing with this subject. A large number of these publications deal with modifications or improvements of the method described originally by Lorenz, a fact which illustrates that the results gained by the orig-

* Read before the Fifty-seventh Annual Session of the Illinois State Medical Society, May 21-23, 1907.

inal Lorenz method do not come up to all expectations, as far as a complete cure is concerned. The different statistics published on this subject have only problematic value, as quite often the figures giving the percentages of recoveries of the joint are too low.

The most favorable statistics, however, do not show more than 50 per cent. of restitutions of the joints, while a little more than 40 per cent. of anterior redislocations are obtained, or, as they are often called, subspinal positions. These subspinal positions form a much less desirable result than the anatomical restitution of the joint, as the head of the femur is not enclosed in the socket but located just above the socket, beneath the anterior superior spine of the os ilei, on the anterior surface of the pelvis. This position naturally involves some shortening of the leg operated upon; in case the shortening is compensated either by a high sole or by tilting of the pelvis, the patients are very much improved as far as the gait is concerned. There is, however, the danger that this improvement of the gait or, as Lorenz calls it, "functional result," may be only a transitory one, on acount of the fact that the femur head has quite often the tendency to change its temporary quarters beneath the anterior superior spine and to slip gradually backward to the posterior surface of the pelvis. This danger is the reason why a great many orthopedic surgeons in opposition to Lorenz did not call such results "satisfactory," but tried to avoid them by introducing some modification into the standard method described by Lorenz.

Investigations into the pathological anatomy of the congenital hip joint dislocation furnished the explanations of the mechanics of the production of the subspinal positions. Especially the early publications of Lange and Schede dealt with this subject. Lange's conclusions are in brief as follows: A very marked anatomical change which is almost always present in all cases of congenital hip dislocations comprises the angle of inclination between the neck of the femur and the shaft, which in normal cases is about 135 degrees. In cases of congenital hip dislocations this angle is found either increased or decreased, similar to the increasing or decreasing of this angle, which we find in cases of coxa valga varus. The angle of twisting of the femur neck, that is, the angle which is formed by the axis of the neck and the horizontal axis of the femur condyles (seen in a vertical projection) is mostly found increased. In extreme cases it is nearly 90 degrees. Thus the femur neck, instead of facing the socket as in normal cases, looks straight forward past the socket in such cases of congenital hip dislocations, whenever we place the thigh in the normal position of the erect standing person. From this Lange concludes that the only fit primary position, that is, the position in which the cast should be applied, should be a medium abduction with intrarotation of the thigh.

These anatomical explanations cover in general the anatomical foundations of our paper, and very little has to be added with regard to the conditions of the socket and the capsule. As we know, the socket is shallow in most of the cases. The capsule covers the empty cavity tightly, leaving an entrance only in the posterior superior quadrant of

the socket. In this way a pocket-shaped recess is formed by the socket and capsule spoken of in the German publications as *"Pfannentasche."* As its entrance lies in the posterior superior quadrant of the socket, the axis of the recess goes from above behind and sideward to down in front and inward. Around the entrance of the recess, which is formed in its anterior part by the capsule fibers and in its posterior part of the upper rim of the socket, the funnel-shaped upper part of the capsule is inserted which covers the head. In older cases the narrow part of the capsule, which corresponds to the entrance of the pocket-shaped recess, is also often described as the hour-glass-shaped contracture of the capsule. The idea of curing any given case of congenital hip-joint dislocation is to pass the head of the femur through the entrance of the pocket-shaped recess and to keep it within the socket or the pocket-shaped recess of the socket.

The first problem, the passing of the head through the entrance of the pocket-shaped recess, has been solved by the various methods of reduction, the most popular one of them being Lorenz's method of reducing the head of the femur over the posterior rim of the socket. The second proposition, the securing of the head of the femur within the socket, is satisfied by placing the thigh into the so-called primary position, and keeping the thigh in this position by means of the plaster-of-Paris cast. The well-known primary position which Lorenz advocates consists in a rectangular abduction of the thigh, where the interior condyle of the femur faces the frontal plane.

In discussing the value of any primary position we must admit that its value depends only upon the degree of security with which the head of the femur is imbedded into the socket, the pocket-shaped recess. In doing this we have also to reckon with the pathologic anatomic changes of the upper end of the femur. A brief consideration shows, then, that the Lorenz primary position meets the foremost requirement, that is *security* only in cases where the upper end of the femur shows but slight twisting of its longitudinal axis, and that the Lorenz primary position necessarily creates the subspinal positions in cases where the twisting of the upper end of the femur is more pronounced.

A practical example will illustrate these conditions clearly. Let us suppose that we have to deal with a thigh the axis of the neck of which is twisted for about 90 degrees against the axis of the femur condyles. We grant further that reduction has been accomplished, and force now the femur head into the Lorenz primary position, the rectangular abduction, where the interior condyle of the femur faces the frontal plane. The twisted neck of the femur necessarily runs in a more or less vertical direction nearly parallel to the axis of the body. Resuming what we said about the axis and the entrance of the pocket-shaped recess, we find that the femur head can not possibly stay in the socket or the pocket-shaped recess after the placing of the thigh in the Lorenz primary position. The explanation of this fact is easily understood, if we bear in mind that the head and the neck of the femur can only be introduced and stay in the pocket-shaped recess if the axis of the neck of the femur

and that of the pocket-shaped recess run in the same direction. This problem is perfectly solved by making the reduction, when we bend the thigh rectangularly, rotate it slightly inward, extend it and press against the trochanter, thus pushing the head of the femur into the pocket-shaped recess.

After the placing of the thigh in the Lorenz primary position, however, we find that the axis of the neck of the femur, instead of running from sideward above and behind to down inside and in front, runs from downward straight upward; that is, in an almost opposite direction. Therefore, the Lorenz primary position holds the head of such a femur only with a part of its circumference within the pocket-shaped recess, if at all, and slight mechanical causes may push the head out of its place again. All the jerks, for instance, that are caused by the walking are transmitted by the leg and the thigh to the femur neck, and likewise the rotations of the thigh around its longitudinal axis, which the patient performs in taking steps. These constant injurious impulsions tend to wear off the cartilaginous superior rim of the socket, against which the head of the femur rests, and an anterior superior redislocation forms itself gradually during the time the patient wears the cast.

The above-explained mechanical reasons caused me to abandon the original Lorenz primary position and to adopt another one, which answers the mechanical conditions in a better way. This position is the rectangular abduction, in which the knee-cap faces the frontal plane (or neutral rectangular abduction, without rotation). This position is equally applicable for all the different degrees of twisting of the upper end of the femur. In no case of this new primary position a larger angle than 45 degrees is formed by the axis of the pocket-shaped recess and the axis for the femur neck; in average cases, however, not more than 15 or 30 degrees. As in this way the axes of neck and recess differ from each other only a little, and the head of the femur is fully emerged into the pocket-shaped recess. The center of the head *does not look toward the middle* of the Y-shaped cartilage, an aim which is, for instance, intended by all modifications of the Lorenz method that advocate inward rotation, *but looks in my primary position toward the fundus of the pocket-shaped recess.* This fact also differentiates it from all the modifications using intrarotation of the leg operated upon. The right position of the leg is maintained by a plaster-of-Paris cast which reaches as far as the ankle joint or in some cases even as far as the toes. Five or six days after the operation the cast is cut away around the knee-joint, and a pair of steel hinges are inserted in order to allow the knee-joint all motions.

TECHNIC.

As the modification does not concern the method of reposition, my primary position can be applied in combination with any method of reduction, no matter whether the reposition is made over the superior, posterior or inferior rim of the socket, or whether it is performed by hand or by the use of machines. All the different methods accord in one feat-

ure, and this is the position of abduction into which the leg is placed either during the time of the reposition or at least during the last act of the reposition. If one chooses to use my primary position, this position of abduction is increased until the rectangular position of abduction is reached, and the leg placed in such a way that the knee-cap of the extended leg faces the frontal plane. The rather brutal maneuvers for the widening of the capsule can mostly be omitted, or, if necessary, restricted to a few maneuvers, which tend to increase the abduction. The patient is then placed on the ordinary pelvic support, while the back is supported by a small padded bench. The pelvic plate of the pelvic support should be elevated above the plane of the table for exactly the length of the leg. The thigh of the well side is held by an assistant and pushed downward, whereas the knee-joint of the side operated upon is rectangularly flexed, the thigh well abducted, and the foot placed on the edge of the table. Into the border of the table corresponding to the side operated upon, a nail is driven, to which two slings have to be attached. One of these slings goes around the ankle joint, the other strap around the knee-joint of the leg operated upon. These straps should be tightened as much as possible. In this way the leg of the patient is securely held in place during the application of the cast. The cast covers in this way both slings, the ends of which are carried through the cast.

After the edges of the cast are trimmed, the patients are put to bed in such a way that the leg operated upon hangs over the border of the bed and is supported by a footstool. Five or six days after the operation the cast around the knee is cut away, and the above-mentioned steel hinges are inserted and fastened to the cast by some crinolen bandages. At this time the stretching of the knee is begun. Two or three weeks following the operation the patients are free from pain and begin to walk, or, rather, to take steps with ordinary shoes.

Only one cast is worn during five or six months. After this time some after treatment is administered consisting in some massage. Within a surprisingly short time the abduction of the leg operated upon corrects itself, so that in some cases the patients walk normally in less than a year after the operation.

My experiences with this primary position cover nearly four years and are most satisfactory. Practically I did not have since that time any subspinal positions, although in a good many patients the anatomical conditions were extremely unfavorable. But even more, cases already treated unsuccessfully by the original Lorenz method (among them three cases operated upon by Lorenz himself) furnished complete restitutions of the joints. What can be claimed as advantages of the new primary position are, in short: the avoiding of the brutal widening of the capsule during the operation, and, therefore, less pain for the patient after the same, the restitution of the joint in almost all cases, obtained by the administration of only one cast, and simplification of the after-treatment.

These facts should advocate my primary position by itself.

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DISCUSSION ON THE PAPER OF DR. MUELLER.

Dr. Edwin W. Ryerson of Chicago:—Mr. President: This position advocated by Dr. Mueller is one that has been in use by Schanz of Dresden for several years, and has been written of, as you know, by Drs. Mueller, Schede and others. It possesses, therefore, no originality; but, on the contrary, to my mind it has several disadvantages. In the first place, when you get a child up in the "frog" position, with its leg sideways, it is hard enough for the child to get along with the legs hanging straight down; but when you rotate the legs around so that they point posteriorly, the after-treatment, instead of being simplified, is complicated. It is impossible in some cases to make the child comfortable in bed. It has to be propped up by several pillows to give the legs a chance to drop down on the bed without pressing on the ankles too much. It is not necessary to use Dr. Mueller's position, because if the casts are properly applied, after the reduction of any given congenital dislocation of the hip, nothing further in the line of position will be necessary beyond a right angle abduction in the vast majority of cases. The reason why Lorenz still gets so many anterior displacements after his operations is because, as was pointed out by Dr. Edward Ochsner a couple of years ago, he puts on so much padding that as the buttocks atrophy, as they always do, while the child is lying in bed, the upper part of the cast holding the femur pushes forward a little because the pelvis sinks backward. That in itself pulls the head of the femur into an anterior position, so that by using much less padding than Lorenz uses, by putting on the cast securely, having an assistant on one side and yourself on the other to compress the pelvis and hip joint antero-posteriorly, while the plaster is hardening, you will avoid anterior transpositions. Since I have become aware of this method, I have seen no anterior transpositions in a large series of cases I have operated on. Dr. Ochsner reported thirteen cases in which this procedure was carried out, with no anterior transposition. There is no use in subjecting these patients to the disadvantages of having the legs twisted around in a position where they can not walk with comfort, when by a simple maneuver, such as I have described, we can allow the child to walk soon after the casts have been put on in a double hip dislocation with the aid of a small chair, the child being able to learn to walk rapidly, so that many of them can walk fairly well shortly after the operation has been performed.

Dr. Mueller (closing the discussion):—Dr. Ryerson has said that this primary position is not original. Of course, it is almost impossible to present anything original so far as primary position is concerned, because primary positions were tried long, long ago. These primary positions were tried as early as 1894 and 1895. Most of the orthopedic surgeons follow the Lorenz primary position, which is really an extra rotation, although Lorenz says there is no rotation at all. Schede and Lange and other followers have used intrarotation, because no one before used this extreme abduction of the leg.

So far as padding is concerned, I may say that it has very little bearing on the outcome of any given case. I was able to look up more than 800 cases of congenital hip joint dislocations in Vienna, and a good many in this country, and I must say that one factor which causes anterior superior dislocation is extra-rotation of the thigh by letting the head out of position when you correct the leg. This modification of the primary position has one great advantage, and that is no rotation of the leg remains after the position of the leg is corrected. If you will look up the cases operated on after the Lorenz method, you might find 80 cases among 100 in which there is decided outward rotation of the leg after the cast has been taken off and union completed. This rotation of the leg is important, and it is even dangerous, because it causes rotation of the pelvis, it causes rotation of the spine, and it causes in almost all cases a beginning scoliosis.

THE MEDICAL TREATMENT OF NEPHROLITHIASIS URICA.*

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The treatment of nephrolithiasis must concern itself, first, with preventing the deposit of concretions in cases that are predisposed to the formation of renal stones; second, with facilitating the passage of the concretions after they have once formed; third, with preventing secondary infections; and, fourth, with symptomatically relieving the pain, the renal colic, the hematuria and other phenomena that occur in the course of nephrolithiasis.

PROPHYLAXIS.

The prophylactic measures that can be employed vary according to the character and the composition of the urine. An individual presenting the syndrome of renal calculi and voiding an *acid* urine, with occasionally a little gravel or sand composed of uric acid, urate or oxalate crystals, must be treated differently from a subject whose urine is *alkaline* and possibly purulent; for in the former one is justified in dreading the presence of urate or oxalate concretions, in the latter, of phosphatic deposits. Uric acid and urate concretions alone will be discussed within the narrow time limits allowed for this paper.

To prevent uric acid or urate deposits the solubility of the urinary uric acid must be increased *ad maximum*. The factors that chiefly[1] determine this solubility are the concentration of the urine, its contents of sodium chlorid, the percentage of uric acid it contains, and, above all, its reaction. The more concentrated the urine and the more uric acid and sodium chlorid it contains percentically the greater the tendency to the precipitations of uric acid and urates in the urinary passages. For these reasons the urine should always be rendered dilute by abundant ingestion of water while the intake of common salt (sodium chlorid) is restricted. The urinary excretion of uric acid should be reduced as much as possible by proper dietetic means and the reaction of the urine regulated in such a way that it is never allowed to remain strongly acid.

THE PROPER DIET IN NEPHROLITHIASIS URICA.

The following considerations should govern the selection of the diet in nephrolithiasis urica as in any other manifestation of the so-called "uric acid diathesis." The old view is that uric acid is an oxidation product of albumin and an intermediary product in the formation of urea; the new view is that uric acid is a specific metabolic product of a special kind of albumin, viz., nucleins.

Nucleins are the chief constituent of all cell nuclei and are, hence, contained in many articles of food and also in the tissues of our own body; uric acid may, therefore, be derived from either. As a matter of

* Quoted in part from the author's book, "Clinical Therapeutics," and presented before the Fifty-seventh Annual Session of the Illinois State Medical Association, May 21-23, 1907.

1. In all forms of nephrolithiasis there must also be a cementing material (mucus, fibrin, pigments, etc.) that makes a concretion out of a fine sediment.

fact, the administration of nuclein or of nuclein-containing foods by the mouth is followed by an increase of the uric acid excretion in the urine. On the other hand, a subject fed for a long time on a diet containing no nucleins (see below), or a subject after a prolonged period of fasting, still excretes appreciable quantities of uric acid. In the former instance the increase of uric acid was derived from the food nucleins; in the latter the excreted uric acid was derived from the tissue nucleins.

The formation of uric acid from the food nucleins we can control; the formation of uric acid from our tissue nucleins we can not control. Whereas the former factor is constant and independent of the individual, in the sense, namely, that a definite quantity of food nuclein invariably leads to the excretion of a definite and calculable quantity of uric acid, the latter factor is inconstant, varies in different individuals and can not be calculated in advance. One has only recently learned to understand the influence of diet on the uric acid excretion, and, above all, the influence of the food nucleins on this function.

MEATS.—There is much disagreement and misunderstanding in regard to the use of meat. One group of extremists interdicts the use of meats altogether; another makes artificial distinction between dark and red meats, and a third insists on a diet consisting almost exclusively of red meat ("Salisbury diet"). I see the matter as follows: The use of a moderate amount of meat is not only permissible, but necessary. Some care must be exercised in selecting the kind of meat and in determining its quantity and its mode of preparation. The administration of nuclein or extractives (uric acid and the purin bases) should be reduced; hence all meats containing many cell nuclei, i. e., all internal organs (liver, kidneys, sweetbreads, brain, thymus) should be rigorously excluded. All meat extracts, broths, sauces and gravies contain the extractives and are consequently bad. Raw meats, smoked and cured meats, sausage, etc., because they still contain the extractives, should also be limited.

To exclude the flesh of fowl because birds produce more uric acid than mammals is based on the erroneous conclusion that consequently their muscles are also particularly rich in uric acid. There is no reason to exclude poultry. It has also been shown by exact analyses that there is no difference in regard to the uric acid content between the dark and the white meat of birds. This distinction is, therefore, also unnecessary.

Boiled meat is better than roast or fried meat, because the extractives have been removed from the former. Some writers maintain that the quantities of extractives introduced with meat are so small that they can not possibly exercise an appreciable effect; there is, however, some evidence to show that these bodies, administered in small quantities for a long time, may exercise a cumulative effect.[2] It is safer, therefore, to adhere to the foregoing rules until evidence to the contrary is forthcoming.

We are unable, of course, to directly control the nuclein economy of the organism proper, by restricting the use of nucleins, for the body is capable of building up its tissue nucleins from any proteid and phosphorus-containing pabulum. We know, for instance, that whole peoples

2. Croftan: The Rôle of the Alloxuric Bases, etc., Am. Jour. Med. Sciences, 1901.

live on a vegetarian diet free from nucleins (these, by the way, are remarkably free from gout).

The albumin of the meat exercises no direct effect on the excretion of uric acid and may, therefore, be considered an essentially indifferent constituent of flesh as far as the uric acid economy is concerned. The quantity of meat should, however, be limited, although not reduced too much. The organism requires a definite quantity of nitrogenous material, and, while it is possible to supply all the nitrogen required in articles of food other than meat, this procedure necessitates feeding the patient with large quantities of bulky material, leaving much residue and taxing the digestive apparatus very severely. It is more natural and more rational to supply a portion of the nitrogen in meat, especially as the withdrawal of meat constitutes a great hardship to many patients and it would be unnecessarily cruel to stop its use. One pound of meat, moreover, contains as much nitrogen as several pounds of most other nitrogenous articles of food.

Unless the caloric value of the diet is carefully calculated there is always danger of underfeeding the patients when meat is withdrawn. This is a dangerous possibility, for it favors the development of gouty cachexia, lowers the tone, and therewith reduces the activity of the oxygenation powers of the body. If nitrogen is deficient the organism, moreover, compensates for this deficiency by increased catabolism of its own (nuclein-containing) tissues. On the other hand, too much meat is certainly bad, for, in the first place, meat produces a distinct digestion leucocytosis, followed by the disintegration of leucocytic nuclei; in the second place, meat reduces the alkalinity of the blood owing to the sulphur and phosphorus it contains; for these elements, as we have seen, are oxidized to sulphuric and phosphoric acids, and as the bases (potassium, sodium, calcium, and magnesium) liberated from the meat at the same time are incapable of completely neutralizing these acids, acidulation of the bodily fluids occurs (corned beef is particularly bad in this respect because all the basic salts are leached out in its manufacture and replaced by neutral sodium chlorid); in the third place, meat taxes the eliminating powers of the kidneys very much and these organs must be spared and protected in the uric acid diathesis.

Eggs.—Eggs in moderation may be permitted. True, the yolk of egg contains abundant nuclein (vitellin), but this nuclein is different chemically from the nucleins of meat and can not split off uric acid. The white of the egg exercises no effect on the uric acid excretion even when given in large quantities; of course, it, too, like meat albumin, can reduce the blood alkalinity. Where it is well borne, it is, however, a very convenient form in which to supply nitrogen.

Milk and Cheese.—An exclusive milk diet, as advised by some, is always bad, particularly in old people, for the digestion of large quantities of water incident to abundant milk drinking must needs overtax the heart, the arteries and the kidneys. Milk as an addition to a mixed diet is good if it can be borne; here we must individualize. The nucleins it contains are paranucleins and do not produce uric acid. Milk slightly

reduces the alkalinity of the blood, owing possibly to the generation of lactic acid and to the oxidation of its proteids. All these theoretical disadvantages are, however, over-compensated by its highly nutritious character and its powers to stimulate diuresis.

In the manufacture of cheese the basic alkali salts contained in the milk are dissolved in the whey; hence cheese is poor in these salts. The same objections can, therefore, be formulated against its use as against corned beef (see above), viz.: that it acidulates the blood owing to the formation and incomplete neutralization of sulphuric and phosphoric acids; in addition, the free fatty acids that cheese contains may enforce this effect. As a matter of fact, the urinary acidity increases after a cheese diet. Empirically, cheese has been known to precipitate gouty attacks, and in certain regions of Germany where much cheese is eaten urinary calculi are said to be very frequent. I consequently exclude cheese from the dietary, although there is no compelling scientific reason for doing so.

FATS.—It has been argued that fat should be omitted from the diet in uratic cases because it is so readily oxidized and hence prevents the oxidation of the nucleins. Withdrawal of fat does not, however, exercise any effect on nuclein catabolism nor on uric acid excretion. Excessive feeding with fat has, on the other hand, been known to cause an increased excretion of uric acid. Paradoxical as it may sound, fat is particularly indicated in those cases that are inclined to obesity; for if fat is added to the diet the appetite is more rapidly appeased, the patients consequently do not eat so much, and are, above all, not so apt to gormandize. As uric acid patients should be instructed to take much physical exercise, the addition of some fat to the diet is almost indispensable to maintain full nutrition. If, therefore, certain individual idiosyncrasies, and also the state of the digestive apparatus, are duly considered, there is no valid objection to the use of fat in moderation.

CARBOHYDRATES.—Carbohydrates exercise no appreciable effect on the uric acid excretion nor do they irritate the kidneys. They do, however, favor the development of dyspeptic disorders, because they readily undergo fermentation and because they are so bulky. As all carbohydrates are quite soluble and are easily absorbed, patients living on a carbohydrate diet are very apt to ingest too much nutriment. Many persons, for instance, could without difficulty master 1,000 grams of carbohydrate in the form of bread, cake, potato, etc., a day, whereas no one would be tempted to eat an equivalent quantity of fat (440 grams) or of albuminous food (1,000 grams). Carbohydrates, moreover, favor alimentary glycosuria and indirectly the development of diabetes and obesity, both complications that are not infrequently seen together with the uric acid diathesis. Carbohydrates should, therefore, be restricted. In cases complicated with diabetes or obesity they should temporarily be forbidden altogether or replaced by fat. In patients suffering from dyspeptic complications, or in persons inclined to overeat, their use should also be restricted.

FRUITS AND VEGETABLES.—Certain of the bulbous vegetables, viz.,

potatoes, cabbage, etc., contain a very large percentage of carbohydrate and very little proteid; as they, therefore, possess all the disadvantages of carbohydrate foods, and only very slight nutritive value in proportion to their bulk, they should be used sparingly in the uric acid diathesis. They are also apt to undergo fermentation and to produce dyspeptic disorders. Salads and all green vegetables, on the other hand (with the exception of young germinating plants, such as asparagus, that contain much nuclein) may be given freely. They contain relatively little carbohydrate and a large proportion of salts. The large residue of cellulose they leave in the digestive tracts stimulates peristalsis and aids in keeping the bowels open; this is a desideratum in gouty cases. Celery and onions are to be forbidden on account of the irritating oils they contain.

All fruits, either deciduous or citrous, may be permitted. The acid salts they contain are converted into carbonates and render the urine alkaline; they contain very little carbohydrate. Empirically, too, we know that they act beneficially in the uric acid diathesis (so-called "fruit cures"). Fruit acids exercise no distinct effect on the excretion of uric acid, with the exception of tannic acid, which seems to decrease it.

Water.—Water should be the chief beverage. Forced water-drinking, however, is unnecessary, even harmful, although it is advised by some authors. Excessive water-drinking does not increase the excretion of uric acid; nor does increased diuresis by any means signify increased excretion of urinary solids. Water in a sense is a distinct irritant of the renal epithelium; in gouty nephritis, therefore, and in cases of beginning renal insufficiency water in excess may do harm. Where there is much arteriosclerosis, with a weak heart muscle, the flooding of the circulation with water can only be detrimental. On the other hand, the amount of water should not be reduced too much, for we know from clinical experience that this practice favors the formation of urinary calculi. A uric acid patient should, therefore, drink from one to one and a half liters of water a day, not more and not less. It is better to order the frequent drinking of small quantities than the drinking of large quantities at long intervals. It is a good plan to have the patient drink one-fourth of a liter of warm water immediately before going to bed.

Mineral Waters.—The favorable effects that are said to be derived from the use of numerous well-advertised mineral waters are probably due to the water, and not to the salts in solution; the so-called uric-acid-solvent virtues of many of these salts seem highly problematical to me. The best mineral waters are those that contain abundant calcium (Wildungen, Fachingen, Centrexéville).

Tea and Coffee.—Tea, coffee, cocoa are usually considered bad. I think their use should be greatly restricted in uric acid cases. They contain certain members of the group of alloxuric bases (caffein, thein, theobromin, adenin, etc.), and, as these bodies are direct precursors of uric acid, some of them are presumably in part converted into uric acid in the organism; at all events the excretion of uric acid is increased after some of these substances are given by mouth. While excessive tea or coffee drinking is, therefore, to be absolutely condemned, the moderate

use of thin tea or coffee is, I think, permissible, particularly in persons who crave these beverages. Tea is by all means preferable to coffee, for it stimulates diuresis. In patients accustomed to alcohol it is also much easier to limit or stop the use of the latter if a little tea or coffee is allowed.

ALCOHOL.—Alcohol-drinking has always been considered one of the chief causes of gout. In view of the almost universal prevalence of the alcohol habit, however, this proposition is difficult to prove. There can be no doubt that an alcoholic debauch may occasionally precipitate an attack of renal colic in a predisposed subject, and that sufferers from any manifestation of the uric acid diathesis as a rule feel better if they abstain from alcohol. Alcohol is a direct irritant of the digestive tract, of the circulatory apparatus, and of the kidneys. No distinct and uniform effect of alcohol on the excretion of uric acid has so far been determined, notwithstanding the fact that a veritable flood of investigation has been published on this question. The food value of alcohol is of subordinate importance in goutiness, for here there is no loss of valuable pabulum in the urine as in diabetes. Alcohol, chiefly on empirical grounds, is, therefore, as a rule, to be forbidden. At the same time we occasionally encounter a patient who does better if a small quantity of some alcoholic beverage is permitted. Champagne, sweet wines, cider, liqueurs and malted liquors are to be absolutely avoided; dilute Rhine or Mosel wine or claret or whisky with water, all in very small doses, may at times be allowed. The previous habits of the patient, his temperament and character, must be carefully considered.

THE REACTION OF THE URINE.

The most important element of all in the treatment of nephrolithiasis urica is the regulation of the reaction of the urine, for it is a well-established fact that alkaline urates are more soluble than acid urates or uric acid itself. To render the urine less acid and to promote the solubility of uric acid, alkalies, i. e., chiefly sodium carbonate and bicarbonate, or alkaline mineral waters, are commonly given. The essential influence undoubtedly exercised by the administration of alkalies upon the solubility of uric acid in the urine is the change in the relative proportion of acid, neutral and basic phosphates in the urine that they bring about. For uric acid is readily soluble in basic phosphates (di-sodium phosphate), but insoluble in acid phosphates (mono-sodium phosphate); the addition, in fact, of mono-sodium phosphate to a solution of uric acid in di-sodium phosphate will cause the precipitation of the uric acid. It is clear, therefore, that the solubility of uric acid in the urine is enhanced by the presence of di-sodium phosphate, and that the tendency to the formation of uric acid concretions increases in proportion to the amount of acid phosphate that is excreted through the kidneys. It is also clear that any effort directed towards preventing the precipitation of uric acid in the urinary passages must be concerned with increasing the amount of basic, and decreasing the amount of acid, phosphates. The ideal would be to cause the complete disappearance from the urine of mono-phosphate

and, at the same time, to produce an elimination through the kidneys of a quantity of di-phosphate sufficiently large to hold all the uric acid excreted in solution. This can be accomplished in two ways, viz.: either by decreasing the phosphoric acid in the blood that enters the kidneys or by increasing the sodium in this blood. The latter object can be accomplished by sodium salts, but, better still, as will be presently shown, by calcium salts.

THE DECREASE OF THE URINARY PHOSPHORIC ACID.—To decrease the phosphoric acid its source must be considered; it may be derived from preformed phosphates ingested with the food or from the phosphorus contained in the albumins (chiefly nucleins) of the food or of the body tissues proper. By eliminating from the diet, on the one hand, pabulum containing preformed phosphates or nuclein-containing food, and by removing, on the other hand, from the blood and tissues, *through other channels than the kidneys,* the phosphoric acid that must inevitably be formed from the degradation of our own tissues, we can reduce the urinary phosphate excretion.

THE ADMINISTRATION OF CALCIUM SALTS.[3]—We possess a remedy that both directly and indirectly regulates the phosphoric acid content of the blood and hence of the urine, viz.: calcium salts. For, in the first place, calcium forms insoluble salts with the alkaline phosphates contained in our normal food, and in this way prevents the absorption of this moiety into the blood. In the second place, calcium, owing to the great affinity it possesses for phosphoric acid, combines with the phosphoric acid encountered in the blood stream and causes the elimination of this proportion in the form of calcium phosphate—not, however, through the kidneys, but in great part through the intestine. This is an important point, for, in contradistinction to sodium, potassium and magnesium, all elements that are chiefly eliminated through the kidneys, calcium is principally (85 to 95 per cent.) eliminated through the bowel.

It will be seen, therefore, that calcium given by mouth can, first, prevent the entrance of a certain proportion of preformed phosphoric acid (phosphates) from the food into the blood, and can, secondly, prevent some of the phosphoric acid formed in the organism from passing into the urine by causing its elimination through the intestine.

The best calcium preparation is the carbonate, i. e., ordinary chalk, tooth powder. This may be given in doses of fifteen to twenty grains three times a day. More may be given with impunity. It is necessary to individualize. The smallest efficient quantity of any drug is always the best dose. The urinary calcium, phosphorus and uric acid excretion can to advantage be determined in the beginning (the patient being on a fairly constant nuclein-free diet) and the dosage regulated accordingly. The administration of sodium or potassium salts in place of calcium salts is not without danger. For the urine readily becomes alkalinized and a tendency is thereby created to the formation of phosphatic concretions around the uric acid or urate nucleins. The urine, despite the use of

3. See also Croftan: The Use of Calcium Salts in Nephrolithiasis Urica, Jour. A. M. A., 1904.

alkalies, should remain faintly acid; this is very difficult to accomplish when sodium or potassium salts are given for long periods of time, but not at all difficult if calcium salts are employed. The continued use, moreover, of sodium or potassium salts exercises a deleterious effect upon gastric digestion and is not without effect on the corpuscular elements of the blood. Calcium salts do not possess this disadvantage; they are, therefore, by all means preferable.

URIC ACID SOLVENTS.

A word may be said in this connection in regard to certain other remedies that have been recommended from time to time as so-called uric acid solvents. In most cases these remedies are given because they possess the property of dissolving uric acid in the test tube. One is not justified in deducing from this fact that they can also dissolve uric acid in the body, especially after urates have crystallized out or concretions have once formed. It is preposterous to give alkalies or any other remedies with the idea that they will dissolve urate concretions. One might as well give ether to dissolve the fat of the body in obesity, or mineral acid to dissolve the calcium out of osteophytes, on the ground that ether or acids can dissolve fat or calcium salts in the test tube. The amount of ingested alkali, moreover, that actually reaches the uric acid deposits (which are usually covered with a thin layer of mucoid material that protects them from "solvents") is so small that a solvent effect can impossibly be accomplished.

This criticism applies with particular emphasis to lithium preparations that are so popular in the treatment of uric acid diseases. In the first place, so-called lithia waters contain only a few decigrams of lithium carbonate to the liter. As they always also contain large quantities of other alkalies only a very minimal amount of uric acid (according to Barthollet's law) would at best combine with the lithia, the bulk would unite with the sodium and potassium salts, while, at the same time, most of the lithium would be promptly excreted as chlorid, phosphate and sulphate. Finally, lithium carbonate, which actually does readily dissolve uric acid in the test tube, is immediately converted in the stomach into lithium chlorid, a salt that possesses only slight uric acid dissolving properties.

Other preparations that have been recommended as uric acid solvents are lysidin and sidonal (the quinic acid salt of piperazin). I have never been able to convince myself that either of these remedies exercise any solvent effect whatsoever in nephrolithiasis urica. Urea, too, is considered a uric acid solvent, and it actually possesses the power to a very marked degree of dissolving uric acid outside of the body. Clinically, however, the results obtained from the administration of large amounts of urea have been, on the whole, unsatisfactory. What beneficial effect it occasionally exercises in ridding the renal passages of small concretions must presumably be attributed to its marked diuretic effect. Benzoic acid in the form of sodium benzoate in water has been extensively used. It does not dissolve urate concretions, but it acts as a urinary antiseptic

and hence may prevent infection of the urinary passages, with disagreeable secondary consequences like pyelitis.

Urotropin (hexamethylentetramine) may possibly vindicate its claim to being a uric acid solvent in nephrolithiasis. It splits off formaldehyd in the body and the latter combines with uric acid to form a soluble compound. The urine of patients who have taken large doses of urotropin acquires the power to a marked degree of dissolving the uric acid. Urotropin is, besides, a very effective urinary antiseptic, so that it deserves extended trial in nephrolithiasis urica. It should be given in five to ten grain doses, in a full glass of water, two or three times a day.

TO EXPEL THE CONCRETIONS.

One of the most useful remedies to promote the expulsion of concretions that we possess, aside from diuretics and abundant water-drinking, is glycerin. It should be given in large doses of 50 to 100 c.c. in lemonade or water. Its mode of action is not well understood, but symptomatically it occasionally aids in the expulsion of small concretions. The urine should, however, always be carefully examined for evidence of renal irritation, for in certain subjects glycerin produces hematuria; as soon as blood appears in the urine the administration of glycerin should at once be stopped. Olive oil, too, has been used for this purpose.

THE RELIEF OF THE PAIN IN RENAL CALCULI.

For relieving the pain in nephrolithiasis either heat or cold or counter-irritants may be applied to the lumbar region. In the dull pain that is so characteristic of a large stone, heat is usually more grateful than cold, whereas in the acute paroxysms of pain of renal colic, cold usually affords greater relief than heat.

Turpentine or tincture of belladonna (a few drops on flannel wrung out of hot water) applied locally in the lumbar region help the dull ache but exercise no effect upon the colic.

In severe renal colic opium will usually have to be given, either hypodermically as morphin, in doses of one-fourth to one-half grain, or by rectum in the form of a suppository or a starch enema. Chloral hydrate; ten to twenty grains (0.6 to 1.2 gm.) by rectum, also frequently relieves. The patient can to advantage also be placed into a warm bath or into bed with hot water bags to the lumbar region. If these simple measures fail to bring relief, then a few whiffs of chloroform will occasionally not only stop the colicky pain, but actually, like morphin, facilitate the passage of the calculus by producing relaxation of muscular spasms.

RENAL HEMORRHAGES.

Renal hemorrhages, if slight, should be treated by rest in bed, while the bowels are thoroughly evacuated and the patient is temporarily kept on a milk diet. At the same time certain drugs may be given, especially if the hemorrhage becomes obstinate and very severe. The most useful drugs are the fluid extract of ergot, fifteen to thirty drops (1.0 to 2.0 gm.) or preferably the injection of ergot hypodermically, using ergotin, one part, and camphor water, two parts, in doses of three to ten drops

(0.15 to 0.65 gm.). The oil of erigeron, fifteen to thirty drops (1.0 to 2.0 gm.) in capsule may be used if there is no nephritis. Tannigen, ten to thirty grains (0.5 to 2.0 gm.) in powder; the fluid extract of hydrastis, fifteen to sixty minims (1 to 4 c.c.), or, better, the hydrochlorate of hydrastinin, given hypodermically or by mouth, in doses of one-half to two grains (0.03 to 0.1 gm.) repeated, are all useful remedies.

SURGERY.

In case these medicamentous and dietetic measures, combined with rest, fail to stop the pain and hemorrhage; if the attacks of renal colic persist or if severe suppurative pyelitis complicates the disorder, or, finally, if a calculus becomes impacted in a ureter so that the patient's life becomes endangered from mechanical anuria, then recourse must be had to surgical means.

It is well to remember, however, that the tendency to the precipitation of urate concretions generally remains even after mechanical removal of the offending calculi, and that precisely in postoperative cases, in which the diagnosis of nephrolithiasis has been established beyond doubt, a persistent treatment based on the above principles should be rigorously carried out in order to prevent the reformation of renal calculi.

100 State Street.

EXOPHTHALMIC GOITER.

REVIEW OF LITERATURE DURING PAST TEN YEARS AND REPORT OF CASES REGARDING SYMPTOMS AND DIAGNOSIS.*

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CHICAGO.

A critical examination of the literature of Graves' disease as regards symptoms and diagnosis compels us to give special, if not particular, attention to many of the so-called associated symptoms of the malady. This becomes especially important if we desire to make or at least speculate on the establishment of an early diagnosis. In many cases these so-called associated phenomena precede the cardinal signs for weeks, months and even years; so that a thorough understanding and precise comprehension of them in their relations to the pathognomonic symptoms will be of vast benefit to the subject-matter of early diagnosis, after which early treatment may be instituted, which the experience of the past ten years has shown to be indispensable to satisfactory results.

A careful estimate of these side symptoms which so often simulate and in some subjects are part of simple neurasthenia or hysteria will at the same time compel a consideration of them in their relation to Graves' disease, or as being early signs of that disorder. On the other hand, a number of instances are on record in which the cardinal signs were apparently the first intimation of the disease.

Considerable discussion arises among the different authors in regard

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to what should be termed a case of Graves' disease—in regard to what and how many symptoms are necessary to give a particular case that definite term. Since a number of theories have been marshalled to account for the primary origin of Graves' disease, of which the principal are the neurotic, the vascular and the glandular, a discussion naturally arises in respect to priority, significance and identity of the group of various signs and phenomena which should stamp an affection as belonging to the disease in question.

With few exceptions, the subjective symptoms which patients complain of are manifested through the nervous system, and many objective signs of Graves' disease are doubtless due to disturbances of the functions of the various nerves, especially of the sympathetic system; consequently it is not to be wondered at that many observers have in the past concluded that the origin of the disease lay in the nervous system primarily, and that the vascular and glandular symptoms were but secondary expressions.

Extensive and repeated experience has taught us that any and all measures which have accomplished a sufficient diminution of the secretive function of the thyroid gland have, with very few exceptions, resulted in a complete cure or a well-marked diminution of all of the untoward symptoms of the affection; and from that wealth and force of reliable evidence we may proceed to the establishment of a definition of Graves' disease, which will place it in the class of a glandular affection primarily, and a neurotic vascular affair secondarily.

Graves' disease may, then, be defined as an affection of the thyroid gland, resulting in an increase or perversion of its secretion to the point of influencing unfavorably the nutrition and functions of any or all tissues of the body. This influence at times assumes the character of an irritation, causing an abnormal increase in the functional activity of the structures attacked with resultant exhaustion of the tissues involved, presenting various pathological lesions from hypertrophy down to complete degeneration. In other instances, the poison overwhelms the resistance of a tissue, causing primary degenerative changes in the structure involved.

This excessive or perverted secretion exerts its deleterious effects somewhat unequally on the different tissues. In fact, an organ on one side of the body may be attacked, while its fellow of the opposite side may remain entirely intact. This, however, is not a valid objection to the assumption of the action of a systemic poison, inasmuch as similar phenomena occur in diseased conditions which have been definitely proved to be of a general systemic character. The predilection may, then, be explained by a difference in the resisting power of different structures, or even that of the different areas of the same organ.

It has frequently been observed that the initial symptoms of exophthalmic goiter occur simultaneously with or as an immediate sequence of some exciting cause, such as shock, fright or some profound grief. But this occurrence should not lead us to establish a causal relationship between the two facts. It should rather, as in the case of heart failure,

insanity, neurasthenia and hysteria following similar exciting events, be classed as the "straw which broke the camel's back" and not as the weight which represented the real underlying basic cause of the trouble.

We well know that many grave organic affections develop slowly and insidiously and would tend to show their effects in a gradual manner were it not for the introduction of some sudden, acute factor, which, so to speak, explodes the mine and presents the disease immediately in all its glowing colors; and, without further investigation, would be accredited with the sole causal power. Conversely, we find some reported cures of Graves' disease from such slight operative interference as the cauterization of the nasal mucosa, etc.

On the other hand, cures of epilepsy, hysteria and even insanity have been reported from procedures even more simple than the above noted, which, in modern thought, can only be considered temporary or coincident at best. The symptoms of Graves' disease must also be considered in respect to the manner in which they arise. As in many other affections, the symptoms may be primary, due to the direct influence of the circulating poison; or they may be concomitant or secondary, occurring in direct connection with some primary lesion or as a necessary result of that lesion; and, again, from a theoretic standpoint, many symptoms undoubtedly result and continue from a combination of these causes.

The recognition of a symptom as to its being primary or concomitant will largely depend upon the time of its appearance, and the possibility of excluding its dependence on some other condition. The frequent impossibility of classifying symptoms in regard to their origin is undoubtedly responsible for the many and varied theories put forth to account for the existence of Graves' disease. A striking uniformity exists, however, in the pathological findings of removed specimens of the thyroid gland, which have invariably shown typical findings. That these changes support the theory of hyperthyroidization can not be denied when one considers the fact that they correspond to the changes found in compensatory hypertrophy of the portions of thyroid gland allowed to remain after partial thyroidectomy. This constancy of pathological findings does not exist in either the nervous or vascular system, and hence must be considered as a negative argument in favor of the thyroid theory.

McCallum, examining sections of thyroid gland in 28 cases of Graves' disease, finds uniform changes in size and shape of the alveoli, in the character of the epithelial cells and colloid, in the vascular supply, connective tissue framework and lymphoid structure of gland. The alveoli shows a folding in of the epithelium. The cavities send off diverticula. Epithelial cells change from low cuboidal to high columnar, some showing miotic figures. The colloid is diminished in amount and watery in appearance. The vascular supply is very rich; interstitial tissue increased and lymphatics enlarged. He found the parathyroids normal in eight cases examined. These findings agree with Foxwell, Albert Kocher, Joffroy and Achard and others.

After having removed portions of the thyroid gland in animals, Edmunds, Murray and Horsley find that the changes in the portions of gland allowed to remain were identical with those found in exophthalmic

goiter. Stein stated that many bad cases show no apparent changes in the sympathetic system.

Edmunds and Hutchinson report that continuous feeding of thyroid extract to dogs produces all the symptoms of typical Graves' disease, and Notthaft graphically describes the case of a man, 45 years of age, who, during a period of five weeks, had taken 1,000 5-grain tablets of thyroid extract and developed all the cardinal symptoms of exophthalmic goiter three weeks after beginning ingestion of the drug. The doctor had the pleasure of seeing his patient recover after suspension of the extract, the exophthalmos being the last symptom to vanish. It will be but mentioned here that degeneration of the thyroid gland during the course of exophthalmic goiter, as well as extirpation of too great an amount of gland tissue at operation, has been followed by the very opposite set of symptoms, namely, those of thyreopriva.

ONSET, COURSE AND TERMINATION.

For reasons already discussed, the real onset must precede the apparent start of the disease by a considerable period of time, the length of which can probably never be determined. Any one of the symptoms of Graves' disease may initiate it and be followed by others rapidly or over longer periods of time. In some instances only a few symptoms appear, some of the cardinal being absent, and to this group the term "formes frustes" has been given. When colloid goiter precedes the pathologic changes of exophthalmic goiter the course of the disease is, as a rule, more mild and offers better subjects for surgical interference; and to this group Kocher gives the name of struma basedowificata or Basedowified goiter.

The disease may run a rapid and violent course, terminating in early death; it may be characterized by remissions and exacerbations, or pursue a comparatively uneventful course. Some cases have recovered spontaneously.

Halsted, from his studies, remarks that 25 per cent. of cases die within a short time and the remainder continue in a state of uncertain equilibrium. The malady may begin very early in life, but appears most frequently between adolescence and middle life; that is, at a time when glandular activities are at their height. While the majority of cases occur sporadically, a few instances seem to point at an hereditary origin. For example: Brewer reports an instance of three children, aged 7, 10 and 12 years, respectively, in the same family, affected with the disease; also another family of seven children in which four were affected. Curtin reports 97 cases in 35 families, and Oesterreicher relates the case of a woman, herself a subject of Graves' disease and the mother of ten children, eight of whom presented the disease, one of whom had three children so affected.

Sex apparently is a factor in the establishment of the disease. Murray, from 400 cases, gives a ratio of 8 females to 1 male; Putnam, from 32 cases, 6 to 1, and Buchan, from a group of 980 cases, finds 9 women affected to 2 men.

While the majority of cases ending fatally have suffered for years, some patients succumb very soon after the onset of acute symptoms.

Sutcliff reports the case of a woman dying three months after the onset. Foxwell saw a man of 42 years die six months after first symptoms, and Ball saw death only four weeks after acute phenomena.

SYMPTOMS.

From their frequency and association in the disease, struma, tachycardia, exophthalmos and tremor are called the cardinal symptoms of Graves' disease.

According to some observers, struma is a constant appearance, while others do not always find primary enlargement of the thyroid gland. The gland swelling is, as a rule, not great, and may be more pronounced on one side than on the other. The size of the gland varies somewhat, depending upon the fluctuations in the caliber of its blood vessels. Kocher says that he does not know of a case without vascular struma; in reporting 74 cases he finds enlargement of the gland in every patient and describes it as being of thick, elastic consistence. Schultze, in his presentation of 50 cases, also agrees with Kocher, declaring struma as a constant symptom. Murray, in a tabulated report of 180 cases, found struma in 172. Steiner says struma is absent in only 15 per cent. of cases. Depending upon its size and relation to other structures in the neck, the enlarged gland will give rise to symptoms due to mechanical pressure, choking sensation and dyspnea from compression of the trachea, headache and vertigo from interference with the circulation in the neck. Due to the variation in the size of the goiter already mentioned, these symptoms are, as a rule, intermittent and very variable. Kocher describes this condition in 16 of his cases. Kroeger, in St. Petersburg, after having examined 900 patients, concludes that a gland that may be felt and outlined is pathological and constitutes struma.

Tachycardia is no doubt the symptom which is always present to a greater or less degree. The number of heart beats may vary from 80 to 200 per minute. It may beat fairly regularly or be marked by a tumultuous irregularity. It may be the distressing and fatal symptom, giving rise to innumerable secondary disturbances which arise from disordered cardiac functions, dilatation and insufficiency. The rapidity of heart action usually comes on in the shape of attacks, either following excitement or perfect quiet. A pulse which one minute registers 120 may in the next beat 250 times, as in the case of Steiner. Hoesslin speaks of a rhythmic difference in the pulse, using morning and evening comparisons. Collins found that in 59 cases the pulse rate varied from 80 to 180 per minute; and Murray, in 180 cases, finds the pulse rate between 90 and 200 beats per minute. Kocher, in 74 cases, reports the pulse between 92 and 240 beats per minute. The heart action is, as a rule, regular early in the disease, but from cardiac hypertrophy, dilation and broken compensation it becomes irregular and intermittent. Shattock reports a case where the patient had two attacks of syncope and died, and Schultze, from his operative experience with 50 cases, states that the 9 deaths which occurred in his series were due to heart failure, and took place in the subjects having severe involvement of the heart prior to operation.

Exophthalmos, the symptom which gives its name to the disease, was, according to Collins, present in 63 out of 100 cases. von Holst found it

marked in only 5 out of 34 cases. Murray observed it 120 times in a series of 180 cases. Kocher noticed it 63 times in 73 cases, and Schultze in 92 per cent. of his 50 subjects—from which it may be realized that the symptom is only present in a certain percentage of the cases which bear its name.

The condition consists of a forward displacement or proptosis of the eyeballs, and gives to the patient's expression a startled appearance. The condition appears, as a rule, bilaterally and comes on gradually. Hinshelwood reports a case showing as a first symptom exophthalmos of the left eye, followed in three weeks by a similar condition of the right eyeball. Bestis reports three cases in which the exophthalmos was unilateral, the opposite eye remaining entirely normal. The proptosis may be slight or it may develop to an extent making closure of the eyelids impossible, exposing the patient to all the dangers of corneal irritation consequent upon exposure and lack of protection normally afforded by the eyelids. Undoubtedly a number of concomitant symptoms occur in connection with exophthalmos accentuating the other ocular phenomena, due to the direct action of the thyroid toxin. It must also be said that exophthalmos without any other symptoms of Graves' disease can not be considered as belonging to the affection.

Tremor is encountered sufficiently often to style it as a cardinal symptom. It is a rhythmic muscular movement, having an average rate of about 8 vibrations per second and usually of small amplitude. It may affect any or all of the skeletal muscles. It may be best observed in the hand and fingers when extending the forearm. The writing of the patient will show a fine irregularity in the characters. It may be so pronounced as to prevent the patient from buttoning his clothes. Murray found it in 163 out of 180 cases, and von Holst observed it in all of the 34 cases reported by him. Kocher reports tremor in 60 of his 73 patients, and Schultze found it in 66 per cent. of his list.

The associated symptoms of Graves' disease are so numerous and varied that a discussion of them under the various systems seems most practical.

The ocular signs have been considered of particular importance from a diagnostic point of view. von Graefe noticed that in directing the eyeball downward the lower margin of the upper eyelid did not follow the line of vision in the normal regular manner. On the contrary, the eyelid lagged behind or descended in an irregular spastic manner. Murray found the condition present 49 times out of 180 cases, and Schultze in 30 per cent. of those under his care. Burns discovered the sign in nearly one-half of the cases examined by him. The sign may exist alone or occur in connection with all the other signs.

Stellwag's symptom consists of a retraction of the upper lid, resulting in or concomitant with infrequent winking of the eyelid. The retraction is probably due to a spastic condition in the upper lid, and the infrequent winking to partial anesthesia of the cornea, or to a combination of both causes. Murray found the conditions present 70 times in his 180 cases. The recognition of the sign is of special importance on

account of its relation to secondary irritations, infections and at times destructions of the cornea.

Lapersonne reports a case in which the eyelids did not cover the cornea. After a short time the eye atrophied and the cornea reduced itself to a cicatricial line. Terson reports a similar instance. Griffith states the case of a girl, 21 years of age, in which one year after onset of symptoms of Graves' disease the right eye became painful and disorganized, necessitating its removal. These and other instances tend to demonstrate that ocular destruction may result either primarily from the actions of the thyroid toxin on the ocular structures or secondarily due to lack or insufficiency in protection normally afforded by proper action of the eyelids.

Moebius showed insufficiency of the internal recti muscles, giving as a symptom more or less exophoria. That this condition is not confined to the internal recti muscles is proved by numerous reports of palsy of the different external ocular muscles. That Moebius should particularly notice the palsy of the internal recti may well be explained by their function of convergence, as well as their size and importance in comparison with the other ocular muscles, which naturally would demand attention when impaired.

Berger reports four cases in which epiphora or excessive lacrimation preceded other symptoms by a variable length of time, while in other instances he has observed annoying dryness of the conjunctiva and cornea.

Gifford states that in examining a number of cases he has met with unusual difficulty in everting the upper lid, and states that this condition is independent of exophthalmos and may, therefore, be employed as an additional sign.

These ocular symptoms may occur singly or in various combinations with each other. Murray found them all existing together in 27 cases. The claim is made that vision is, as a rule, not impaired, but this statement can not be accepted in view of the fact that many cases have visual defects, and the majority have not been carefully investigated by oculists or submitted to fundus inspection.

The vascular symptoms constitute perhaps the most annoying features to which the patient is subjected, and in many instances give rise to introspective ideas and delusions of infinite variety. They are, for the most part, concomitant in nature, depending on cardiac and vasomotor states for their production.

The sensation of a beating in the chest or palpitation was present 59 times in 100 cases according to Collins' experience. Murray reports palpitation to have been the first symptom in 19 cases out of a series of 120 instances, and in all the cases the cardiac pulsation was felt over a larger area than normally. He found a systolic murmur 17 times over pulmonary valve, 16 times at apex and 8 times over both regions. The cardia rhythm was irregular in 8 cases. A thrill over the thyroid gland was noticeable in 14 cases, and a bruit was audible in 37 cases, of which 23 were systolic in time and consequently of arterial origin, and 7 continuous, due to venous cause.

Donath reports experiences with the blood pressure in Graves' disease, and results show some to have been below normal, some normal, and others above the usual pressure. The lowest pressure reported was 64 mm. and the highest 176 mm. at radial artery. Three factors at least enter into the explanation of indicated vascular pressure, namely, the condition of the heart, that of the blood vessels and state of the vasomotor system.

Arterial throbbing and venous pulse are purely concomitant symptoms and need but be mentioned.

Of the respiratory symptoms dyspnea is the most distressing and is, as a rule, of a paroxysmal type, frequently coming on at night without any apparent cause. It may be independent or in connection with a cardiac attack. Collins found it in 27 instances of 100 patients. Kronlein out of 191 subjects reports 62 having history of paroxysmal dyspnea. Hofbauer calls attention to a change in the respiratory curves. He found increase in length of inspiration and expiration, and irregularity in the height of the individual elevations, and a longer absolute stasis of respiration.

The most striking gastrointestinal symptom is diarrhea. It is intermittent in type or consists only of a liability to diarrhea. Collins found the condition 16 times in 100 cases, and Murray 35 times in 120 patients, with 45 cases of frequent defecation. Constipation was marked in 29 cases of Collins' series. Nausea and vomiting was present 11 times in 100 cases and 7 times in the series of 120.

Matson states that severe vomiting is a symptom common to fatal cases, and reports a case in which death took place in 19 days from this cause. As a rule, the vomiting is intermittent and occurs without any apparent cause.

Pigmentation is the marked cutaneous symptom. The areas may be small or large and, as a rule, confined to no particular locations. The patch may be well defined or shade imperceptibly into the surrounding tissue. The color varies from light to dark brown. Collins found pigmentation 12 times out of 100 cases. Murray found it 20 times in 120 cases. von Schrotter reports a case in which the body was covered with large and small pigmented areas. The eyelids are frequently pigmented, and this is classed by some as a quite characteristic symptom. Murray, in 76 out of 120 cases, noticed an unusual dampness of the skin. Sweating on slight or no provocation, especially occurring at night, is not an unusual condition.

Booth, in speaking of the edemas, classifies them under three groups: the cardiac, from defective heart action; those due to nerve influences on the vascular walls, and transitory types analogous to the angioma sort. The phenomenon of dermography was noted 16 times by Collins.

Hyde speaks of the modification which the different skin lesions present when engrafted on a case of Graves' disease, and calls attention to the telangiectoid condition and liability to subcutaneous hemorrhage, epistaxis, etc.

The action of the thyroid poison on the brain is that of a mild irritant which, however, either through continuous or cumulative effects, presents evidences of grave psychoneurotic or even organic cerebral dis-

case. On the predisposed and mentally defective it may easily be conjectured that this effect will be materially enhanced and vivid.

The majority of patients display a condition of subdued smouldering excitement and irritability of temper, with tendency to explosive mental acts. Murray reports chorea of ideas and insanity in 3 cases. Seventy of his series of cases presented the suppressed excitement; some were irritable, some emotional, and one melancholy with suicidal tendencies. Johnson reports a case of mania, with death from exhaustion. Hirschl hunted up 43 instances with folie manie, melancholia, paranoia, phobeas and general paresis. Clouston reports 3 patients affected with delusions of persecutions and grandeur.

Potain states that in his experience the mental attitude assumed by the patients corresponded to those traits which are the most vicious in each particular individual.

Kinnicutt's tables would argue that the psychic effect is of superficial character, inasmuch as in a summary way of 187 cases subjected to operation whenever improvement followed the psychoneurotic phenomena were the first to disappear or subside.

Adams reports more or less palsy of the muscles supplied by the superior laryngeal nerve in 107 cases, and Kronlein found 49 cases showing disturbances of the voice, 7 of which were demonstrably due to unilateral palsy of vocal cords.

The muscular system was investigated by Askanazy, who at the autopsy of four cases found diffuse interstitial lipomatous infiltration and fibrillary degeneration in the skeletal muscles examined. This accounts for the symptoms of muscular weakness and giving away of the legs so often complained of by Basedow subjects. At least it is one explanation; the other would be found in the condition of the motor nervous system. Recklinghausen describes the same condition and quotes Hansen as having found similar changes in the extrinsic ocular musculature. From a symptomatic standpoint Lemke describes the muscular contractions as slow, difficult and faulty, thereby suggesting the mode of production of von Graefe's sign.

That the process of metabolism is affected, and at times to an astounding degree, ample evidence is at hand. Continuous and pronounced emaciation was a feature in 15 per cent. of Collins' cases. Murray found wasting in 45 cases in his series. This emaciation occurred independently of any of the usual causes and could only be ascribed to excessive metabolic influences.

Nutritional interference was well shown in the case of Griffith, who, having performed a tarsorraphy, had little or no union until partial excision of the thyroid gland, after which union took place completely and rapidly. Perverted metabolism was exemplified in von Schrotter's patient, in whom the upper portion of the body and extremities became thin and emaciated, while the lower half increased very disproportionately in size, the microscopic section of the subcutaneous tissue showing fat.

The diagnosis of Graves' disease implies a change in the structure of the thyroid gland. This alteration is a definite one, and may or may not

be associated with enlargement of the organ. Collins found enlargement in 70 per cent. of the cases, and Murray found 112 enlarged out of 120, with five giving a history of previous goiter. This characteristic glandular change may occur primarily as in the majority of the cases, or it may take place secondarily in any of the other diseased conditions of the thyroid gland. In the latter condition the operative interference has been favored by a very low mortality.

As to how many signs and symptoms are necessary for the establishment of the diagnosis, a great difference of opinion will naturally result. The later and typical cases with the cardinal signs well marked may be easily labeled. In that early stage, or in those conditions in which some of the cardinal signs are wanting, that is to say, the "formes frustes," a recognition of the true nature of the malady will depend largely on the judgment of the observer and the sequence and course of the affection. It may be interesting to know that a number of neurologists, among whom Dana, Sachs and Starr may be mentioned, have expressed themselves as satisfied with the thyroid theory as an explanatory cause for the disease.

The matter of differential diagnosis centers itself about those instances styled the "formes frustes," in which several symptoms are not apparent and those conditions apart from Graves' disease which may present some of the cardinal symptoms, or a number of the associated signs.

Exophthalmos may be due to many causes not connected with changes in the thyroid gland, as may also most of the other signs existing independently.

Pigmentation is a feature of Addison's disease, which fact must be considered.

Cobb, in his experimental work, found that stimulation of the sympathetic in the neck will produce exophthalmos. It could be produced temporarily by ligation of the external jugular vein.

Lowe reports edema in connection with Graves' disease and considers the location of the edema as a differential factor. He found one case in which edema was confined to the middle of the thigh. Rendu reports a case in which both supraclavicular fossæ were the seat of edema, the condition simulating hernia of the lung. Cholmogoroff, having made a study of the condition of the genital female organs during Graves' disease, enumerates his findings as follows: Atrophy of breasts, loss of fat in mons veneris, flaccid condition of labia and vagina; in fact, the picture of senile marasmus.

In regard to pregnancy Kleinwachter related a case which aborted in six weeks and which he considered due to the thyroid gland. One of his patients was ten times pregnant and each time the Graves' disease symptom became more pronounced.

Baldwin reports a case in which myxedema developed after the cessation of Graves' disease, but yielded to thyroid extract treatment.

Personal observation includes 28 cases, of which only a discussion of the percentage value of principal symptoms will be indulged in.

The youngest patient was 16 and the oldest 51 years of age.

Sixteen occurred in females and the rest were males.

Enlargement of the thyroid gland could be demonstrated 26 times.

Exophthalmos was a symptom in 18 cases. The heart action was increased in frequency 22 times, the pulse rate varying between 90 and 180 beats per minute.

Tremor appeared in 18 instances.

Palpitation was complained of 12 times.

Dyspnea of the intermittent type occurred but 4 times.

Weakness of the legs was present in 4 patients.

Twelve cases complained of a tendency to irregular attacks of diarrhea.

Vomiting was a feature in but 3 patients.

Headache occurred 4 times.

Moisture of the skin was noticed in 22 subjects, but typical sweating only in 3 individuals.

von Graefe's sign was noted 6 times, and Stellwag's but 3 times.

Moebius' sign was observed in but 2 cases.

Dysphagia noted 2 times.

Painful cramps in the legs in 2.

Diplopia occurred once.

Pulsation of the vessels of the neck present 5 times, and a systolic bruit 5 times.

Marked cerebral excitation was found in 8 patients and attacks of delirium 2 times.

Pigmentation of the skin was typical in 5 subjects.

Five were constipated, and one presented the condition of diarrhea, alternating with constipation.

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JANUARY, 1908.

THE ANTITOXIN QUESTION.

The Bulletin and Supplement of the Illinois State Board of Health, issued Saturday, December 14, and dated October, 1907, demands attention at our hands, because of several references to THE ILLINOIS MEDICAL JOURNAL and its editor. These references concern articles which appeared in the November and December issues of THE JOURNAL. The first item, mentioned in *The Bulletin* proper, referred to the letter published in our November issue asking about the antitoxin now being supplied *gratis* by the Board in accordance with the law recently enacted by the General Assembly.

On Sept. 25, 1907, we received from a prominent practitioner in Southern Illinois the letter, published in November, making inquiry regarding the reliability of the firm furnishing antitoxin supplied by the Board. Evidently the writer was not familiar with the particular brand of antitoxin supplied by the Board and, as many other practitioners of the state were found to be unfamiliar with this product, the editor believed that the information desired might be valuable to a great many of our members. As the letter was marked confidential, and as the editor was not able to answer it to the full satisfaction of the questioner or himself, he communicated with the writer, asking his consent to put his letter in the correspondence columns of THE JOURNAL in order to bring out discussion on the merits of the Lederle antitoxin. The answer to the editor's letter was dated September 28, and reads as follows:

"If my letter to which you refer goes into print, I prefer it to be over my own signature, as I have nothing to fear from an expression of my opinion. However, if you wish to publish it, I ask you personally to remove from it any crudities and to punctuate it properly so that it can not be assailed as an imperfect production of an untrained mind.

"I also ask you if there is any unjust reflection on the State Board to tone it down, as I have no acquaintance with any member, save Dr. Egan, and my distrust in him is not founded on anything that would enable me to protect myself were he to attack me. I wrote the letter hurriedly and not for publication, and so if you print it you must arrange the sentences in a proper sequence, as a personal letter often looks wretched in print.

"If I mentioned the names of other producers of serum, please omit this, as I am not howling for any particular firm."

On receipt of this communication, the editor answered that, anticipating his favorable response, and thinking possibly that he did not want his name used in connection with the letter, the communication had been forwarded to the publication office, with the initials "S. I." subscribed, meaning Southern Illinois, and, unless he still wished his name added, we would let it go in that way.

From this correspondence it will be seen that the letter which the Secretary intimated was not written in good faith, and was possibly dictated in the office of THE JOURNAL, was really written by an honest inquirer after facts and for the purpose of protecting his patrons, and, furthermore, there was no desire to cast any discredit on the serum being supplied, nor to advertise any antitoxin with which the writer might be familiar. Under these circumstances it certainly became the duty of THE JOURNAL to ask the information for its reader and to protect him in his efforts to learn the truth. From the language of the second letter, in the mind of this writer, it does not appear that the endorsement of the Secretary of the State Board of Health necessarily adds anything to the "strong position" of any preparation issued under his auspices.

Secretary Egan's effort to show that any intelligent physician would be deterred from using the Lederle antitoxin because of the insertion of the letter in our November issue signed "S. I." is absurd.

After having worked himself up to a fine frenzy about this letter through three pages, the Secretary then naively proceeds to tell us something. He informs us, first, that the contract was not let to the lowest bidder and, second, that there are really some persons on the war path for this particular brand of antitoxin. This, notwithstanding the Lederle antitoxin is manufactured under the license of the United States Government and has the endorsement of the Illinois State Board of Health. If the supervision of the United States Government is so efficient and the reliability of the company supplying this serum is so established and the endorsement of the Illinois State Board of Health is so compelling, how does it come that "representatives of other commercial houses supplying antitoxin vie with each other to decry the worth of the antitoxin furnished by the Illinois State Board of Health and that druggists in

several parts of the state have come out in open opposition to the free distribution of antitoxin and have declared their intention of opposing an appropriation for this purpose by the Forty-sixth General Assembly?" As taxpayers, it might also be well for us to ask why the contract was not let to the lowest bidder, all manufacturers being compelled to obtain a license before they enter into the manufacture and sale of their products.

In our December issue, before the issue of *The Bulletin*, the communication of the manufacturers was given in full as requested. Although Dr. Lederle is said to have been formerly Health Commissioner of New York, strangely enough his name is not to be found in either of the National Medical Directories recently published.

Finally, as far as this letter is concerned, there is no question raised regarding the merits of the free distribution of antitoxin. The Secretary's effort to make a mountain out of a molehill, we believe, has ignominously failed and no more attention should be paid to his insinuations and innuendoes on a worthy member of the State Society or on our motives in publishing his communication.

THE OHIO STATE BOARD OF MEDICAL REGISTRATION HAS REFUSED TO HONOR AN ILLINOIS CERTIFICATE.

Under this caption in our December issue we gave a statement of facts and, according to the promise made in that issue, addressed a communication to the Secretary of the Ohio Board and received the following response:

COLUMBUS, OHIO, Nov. 22, 1907.

ILLINOIS MEDICAL JOURNAL, Springfield, Ill.

Gentlemen:—Concerning the refusal of the Ohio State Board of Medical Registration and Examination in granting to Dr. Chas. C. Faws a reciprocity certificate, we beg to state the following:

In June, 1904, Dr. Faws appeared before our board for examination and received an average grade of 65 per cent., 10 per cent. below that required by our board. In December following, he again appeared and received an average of 73 per cent., falling 2 per cent. short. In December, 1905, he again appeared and received an average grade of 71 per cent. In April, 1906, he presented an application for reciprocity certificate, based upon registration secured in Illinois by examination. This application showed that he received a bare passing mark by the Illinois board. In view of the fact that he had recently failed in three successive examinations, the board refused to grant the certificate.

In December, 1906, he again appeared for examination before our board and *failed in all branches*, receiving an average of 56 per cent. In the first examination he failed in five branches. In the second and third examinations, in three branches each time.

He recently appealed his case to the Attorney General and Governor who, after hearing all the facts and arguments by his attorneys, sustained the board in their action, holding that the matter of granting reciprocity certificates was entirely discretionary with the board, and that since Dr. Faws could not in any way claim a residence in Illinois, he was not entitled under the act to make application for reciprocity certificate.

We are enclosing a copy of our statutes and would call your attention to the reciprocity clause in Section "e," which provides that those residing in one state

and desiring to remove to Ohio and practice their profession in Ohio, are eligible to make application, etc. Hoping to be of further service, I am,

Very respectfully, GEO. H. MATSON, Secretary.

Later we sent Dr. Matson the supplement to the *Bulletin* of the Illinois State Board of Health and received the following reply:

COLUMBUS, OHIO, Dec. 23, 1907.

ILLINOIS MEDICAL JOURNAL, Springfield, Ill.

Dear Sirs:—After having reviewed the article of Dr. Myers in reply to your letter to him, and also after reading the article of Dr. Egan in the supplement to the October *Bulletin* of the Illinois State Board of Health, I feel that there is but one point that we might make clear, and that is concerning the preliminary qualifications of Faws. In the article by Dr. Egan he seems to be in doubt concerning this. Dr. Faws filed with us a medical student's certificate, No. 13, issued to him by Prof. H. J. Eberth, Toledo, entrance examiner for Toledo. That is all that is required of any applicant as far as preliminary education is concerned. I am, very respectfully, GEO. H. MATSON, Secretary.

It appears from these communications that the case is "yellower" than appeared in our December issue. After his failure to break into Ohio by the reciprocity route, Dr. Faws again appeared before the Ohio Board, and at his fourth (Ohio) attempt his grading was far below any previous examination in either Ohio or Illinois. He failed in every branch. Comment on the effectiveness of examinations conducted by the Illinois Board seems clearly unnecessary.

We also addressed a communication to Dr. Park L. Myers, Dean of the Toledo Medical College, and received the following reply:

Dr. Geo. N. Kreider, Springfield, Ill. December 13,'1907.

Dear Doctor:—Yours of the 10th, inquiring after the record of Dr. Charles C. Faws is at hand.

Dr. Faws graduated from the Toledo Medical College at the end of session 1903-'04. He attended four full years of more than twenty-eight weeks each. His attendance was always fair, averaging well above the 80 per cent. required by our Ohio law. His average grades upon examinations were of the mixed variety. He stood highest in obstetrics. (During his last session he attended eight cases of confinements, two of them alone.) He did well in medicine and surgery under most of the instructors. In other words, in the practical branches, in the branches in which the physician of the past decade was instructed, he made a fair showing. His average grade on final examination was 77 10/11 per cent. This was not high, but above the requirement of 75 per cent.

The faculty debated his case, ere they granted him a vote as a successful candidate. They took in consideration the fact that he was amongst a number just coming under the new law. That he was over 30 years of age; that he had been a practicing pharmacist for a number of years—having much better equipment in the knowledge of drugs than many students thoroughly grounded in rhetoric, Latin and laboratory branches.

I think I ought to say that, personally, I championed Faws' election. I regarded him as one of the last of the old order of students. The new requirements, preliminary, will make it impossible for a student of some of his defects entering schools of to-day. But I regarded him then—and I regard him now—as a much safer, let me emphasize it, *a much safer* doctor, to enter the average household than the majority of the graduates from our colleges to-day, equipped with skepticism in therapeutics, and a frenzy for surgical fame and procedure.

Dr. Faws' failures, I understand, have been mainly due to his faulty orthography and short information in particularly the laboratory branches. But you know, doctor, that many good men are poor spellers, and many a fine laboratory

student makes a worthless practitioner. I would not condone ignorance, especially in a medical student. But there is to my mind, such a thing as "overtraining," and the study in the dead languages, and the multiplicity of laboratory technics are doing their share in the "scorching."

After all, I believe much of the trouble occasioned by Dr. Faws has been due to an unfortunate set of dispositions in himself and the first Ohio board before which he was examined. He failed fairly enough the first time, but a peculiar pride and an acid temperament did not let him resolve to try again without resentment against the board members. Rather, he went before your Illinois board, passed, and coming back to Ohio demanded, rather imperiously, I am told, that he now be recognized under the reciprocity act. It was the turn of the board members to show their dignity, and they made a first example of the doctor in refusing a recognition. Thus you see the complication. It is unfortunate. His failures, recorded several times, have multiplied the failures scored against our school. The truth is, he is the only recent graduate of our school who has failed anywhere before any state board.

I trust, doctor, I have given you the clear understanding of the "Faws" case you requested. I hope you can assist in curing it. Surely it would long ago have been at rest had not the individual, as usual, had to suffer, rather than the state dignity of a board. Very truly yours, PARK L. MYERS, Dean.

We might add that the Toledo Medical College was founded in 1882, and after twenty-five years of existence the enrollment of students averages from 22 to 25 and the number of graduates from 6 to 9. Only one other college in Ohio, the Patte Homeopathic of Cincinnati, has such a small enrollment, and only three regular schools in America, one in Maryland, one in North Carolina and one in California, all of them recently established, have such a small attendance. Apparently there is no great demand for the existence of a medical college at Toledo. It is hardly necessary to call attention to the special pleading Dean Myers makes for Faws and the grounds for granting him a diploma, which hardly correspond to the comments of Secretary Egan.

About the only alternative left for Dr. C. C. Faws is to come to Illinois to practice. Here he will be received with open arms, especially if he will consent not to make insinuations and veiled attacks against the infallible Secretary of the State Board of Health.

PHILADELPHIA SURRENDERS AT LAST.

Philadelphia has long been renowned for conservatism in every line and her medical men have been no exception to the general rule. Especially in the matter of ethics the average Philadelphia physician has been said to be "an Hebrew of the Hebrews." It is with considerable satisfaction, therefore, that progressive physicians in all parts of the country will learn that the Quaker city has decided to discard the ancient landmarks and take up modern ideas as regards membership in her county society.

Dr. John B. Roberts, one of the most valuable citizens of the city of Philadelphia, because of his efforts in behalf of good government, as well as one of the most distinguished physicians, as long ago as 1891, in his address as president of the county society, said:

"This society should be liberal enough to accept as a member any physician whose education and personal character make him a fit asso-

ciate for intelligent men," and "the test of qualification for membership should not be the college from which the applicant received his diploma, but an education enabling him to understand and appreciate the science of medicine and an honest purpose to treat his patients by all means and methods which experience, investigation and research show to be serviceable."

These views were far from popular at that time and the society had no idea of accepting them. Nevertheless, appreciating the work Dr. Roberts had done for the society, as well as his ability and character, they re-elected him president.

It took sixteen years for the county society to come up to the advanced standards thus set by Dr. Roberts, and it was only on Oct. 16, 1907, that the society by a vote of 119 to 20 revised its by-laws relative to requirements for membership so that it now reads as follows:

Article 1, Section 2.—Active members must be graduates of at least one year's standing of a medical school legally empowered to confer the degree of Doctor of Medicine, must be legally authorized to practice medicine in the State of Pennsylvania, and must have been residents for not less than one year in the County of Philadelphia; provided (a) that all applicants for membership shall be required to state in writing that they do not accept any sectarian designation or base their practice on any exclusive dogma or system, and must satisfy the censors that they possess the requisite scientific and technical education and qualifications; and provided also (b) that the year's residence shall not be exacted from a physician who removes to the county when he is a member in good standing in some other county medical society in the State of Pennsylvania and presents a certificate from that society attesting the fact.

It will thus be seen that a physician is no longer excluded from membership simply because he happens to have graduated from an homeopathic or eclectic college. The element of doubt, always existent among serious-minded physicians as to the exaggerated claims for new methods of treatment in disease, was formerly carried to an extreme, and was followed by actual ostracism in the case of Hahnemannism. Details of treatment that nowadays would be debated and decided within our own ranks were formerly permitted to create schism and to divide seriously our forces and power for benefiting mankind. In the light of the more charitable spirit and freedom of thought of to-day, however, the call has come for unity in the profession, so that the result in Philadelphia was only what in time was to be expected. It will be the general public far more than even the medical men who will derive greatest advantages from these advances in the proper freedom of thought. Perhaps in time even the lay press may be able to grasp the genuine altruism of our calling and cease classing us with trades unions, isms and pathies. Until then—let us live in hope.

Some members of local societies in central Illinois will do well to ponder the arguments advanced in this presentation of the case, which has been largely taken from the columns of the *Pennsylvania Medical Journal*.

THE MEDICAL DEFENSE OF THE MEMBERS OF THE STATE SOCIETY.

There seems to be considerable misunderstanding as to how much the state society proposes to do with the medical defense fund obtained by the assessment of $1.00 against each member of the society. There are some who suppose that for this munificent sum they can obtain rights and privileges which could only be paid by an assessment of $10 per member. We are sure that it is the object of the state society to do as much for its members as can possibly be done, with the amount received, but members should be reasonable in their demands and not expect more than the funds will provide for. In order that there may be some basis on which to work we have asked Dr. Moyer to address us a letter on this subject, and his communication will be found below:

December 11, 1907.

To the Editor:—I notice on page 659 of the December issue of the ILLINOIS MEDICAL JOURNAL the following: "Out of each $5.00 of annual dues paid to the treasurer of the Chicago Medical Society, the trustees are required to turn $1.00 over to the Medical Defense committee of the Illinois State Medical Society for the protection and defense of the members of the society against whom suits for malpractice or damages may be brought."

So far the Medical Defense committee has limited the application of the funds at its disposal to the defense of malpractice suits which are actions which grow out of the contractual relations of physicians and patients. The words in the above quoted paragraph, "malpractice or damages," may be and in one instance have been construed as to imply that the society undertakes to defend physicians for any action in damages that may be brought against them. A fair construction of these words would imply that the committee would undertake the defense of any action brought against a physician for damages which might include anything from a suit for alienating a wife's affections down to an action brought against a physician for damages inflicted by a breachy cow in a neighbor's garden.

It would seem as if this proposition was so self-evident that it is hardly worth while to call the attention of the members to it, but as it has been already misunderstood by one physician, it might be well at an early date to specifically state what work the Medicolegal Committee undertakes to do. Yours very truly,

HAROLD N. MOYER,
Chairman Medicolegal Committee Illinois State Medical Society.

SERIES OF ARTICLES ON TUBERCULOSIS.

With this issue of THE JOURNAL we begin a series of articles on the latest ideas in the treatment of tuberculosis. These articles will be written by Dr. J. W. Pettit, medical director of the Ottawa Tent Colony, and will be based on Dr. Pettit's experience in the conduct of this institution, which was founded as a direct result of the crusade started by the Illinois State Medical Society at its meeting in 1904. Since the organization of the colony Dr. Pettit has visited all the leading institutions of the United States, both East and West, and has collected a mass of evidence on the subject, which will enable him to present a series of articles worthy the attention of every one of our readers. In connection with these articles, it might be well to say that Dr. Pettit will be glad to answer any questions that may occur to any of our readers that are not

fully taken up in the articles themselves. In developing the Ottawa Tent Colony a great many new questions arose which had to be met and properly decided. The success attending the colony has shown Dr. Pettit's skill in meeting these questions, and as a result the colony has been visited by persons from all over the United States who are interested in the establishment of colonies in their own communities. Advice on all points has been freely and gladly given these delegations, and thus the movement inaugurated by the State Society has resulted in great good not only in Illinois, but all over the United States.

POTENTIZATION—AN INSANE PERVERSION OF THE HOMEOPATHIC DOCTRINE.

The Bulletin of the Chicago Board of Health has the following:

"Several attempts have been made to have pupils admitted to school having certificates signed by doctors stating that the children had been 'Potentized.' All such certificates are rejected and will not be recognized.

"It is well enough to explain what a 'potentization' is. We are told that 'variolinum' is given internally to a child and sometimes rubbed on the arm, which process 'potentizes' the child and renders such child insusceptible to smallpox. 'Variolinum,' according to homeopathic authority, is prepared by triturating with sugar of milk matter from a ripe vesicle of smallpox. A few high potency homeopathic physicians are practicing this method of 'potentization.' Homeopathic physicians as a body do not practice or countenance this method. Leading members of the homeopathic school have pronounced against it. There is no evidence that such a procedure as 'potentization' has any protective influence over smallpox whatever. On the contrary, we have vaccinated 'potentized' children and never had any difficulty in making vaccination 'take' in such subjects. The practice is not recognized by any health board, so far as we know, in the world, and will not be recognized in Chicago."

Correspondence.

RESISTING POWERS OF THE AGED.

EDITOR ILLINOIS MEDICAL JOURNAL,
Springfield Ill.

Dear Doctor:—Dr. Helm's note calling attention to the resisting powers of the aged to operations tempts me to write of the following case: Mr. W., aged 86, suffering from purulent nephritis of the left kidney, 95 per cent. of kidney tissue destroyed. I removed his kidney at Mercy Hospital in 1904; he was out of bed smoking a cigar in seventy hours; his recovery was rapid.

Respectfully,
M. T. NAUGHTON,
4109 Vincennes Ave., Chicago.

Dec. 12, 1907.

Special Articles.

STATE PSYCHOPATHIC INSTITUTE GETTING UNDER WAY.*

H. DOUGLAS SINGER, M.D.

Director Illinois State Psychopathic Institute.

The State Psychopathic Institute, now being formed at the Illinois Eastern Hospital for the Insane at Kankakee, has in view the improvement of the medical service of the state hospitals for the insane, both in regard to the care and attention given to patients, and also to the scientific study of this branch of medicine.

The first point to be taken up will be the establishment of a well-equipped clinical laboratory for chemical, hematological, bacteriological and microscopic work connected with the examination and treatment of cases in the wards. As soon as the medical staff can be brought to a full strength a course of instruction in case-taking and record-making will be given, and it is hoped that a number of junior officers will be appointed who will be trained both in the wards and in the laboratory, and thus provide a class of physicians better fitted for promotion in the service. It is the aim of the institute in this way to attract to the state hospitals the best class of recent graduates and others from among whom some at least will be found who will make psychiatry a life study.

Furthermore, the systematic and complete records of the enormous mass of material which is available in the state hospitals, records which it is hoped will be discussed and approved or criticised at meetings of the staff of the hospital, should be of more scientific value in the elucidation of the problems of psychiatry and also serve to keep alive the spirit of scientific research, which is the only foundation for a living interest in this work.

After the clinical side of the work has been thoroughly started it is intended to establish a pathological department for teaching and investigation in which may be undertaken any more thorough examination of pathological specimens than can be carried out in the ordinary pathological department of the hospitals. But this, obviously, can only be of value after the establishment of complete and methodical clinical data.

Until the institute can be thoroughly organized it will be necessary to limit the work to the officers of the Illinois Eastern Hospital, but as soon as possible the various other state hospitals will be invited to send members of their staffs to work for a time in the institute.

The building in which the Psychopathic Institute is being installed at Kankakee was originally erected for postmortem work, but has for some years been used as a general library and meeting-room for various purposes. Considerable alterations in its interior have been necessitated, but are now well under way as regards the fitting up of the clinical laboratory, and a large proportion of the equipment for this department

* From the forthcoming State Board of Charities Bulletin.

has already arrived. This consists of the most modern appliances for the examination of the microscopical, chemical and physical conditions of the blood, urine, cerebrospinal fluid, etc., and also a complete outfit for making bacteriological investigations, comprising incubators, sterilizers and the necessary appliances for the preparation of culture media. Some delay has been caused by difficulties in obtaining suitable plumbing, part of which has had to be made to order, and also from the necessity for importing some items from abroad, such, for instance, as the incubators, which were not obtainable in this country, fitted to be heated and regulated by electricity, which is the only convenient source of heat with which the institution is supplied.

The object of this laboratory is to carry out any of the more complicated investigations which cannot be made at the bedside and is not intended to take the more simple examinations out of the hands of the ward physicians where they properly belong. Arrangements have also been made with the superintendent of the hospital for the institute to take charge of certain wards where an attempt will be made to teach by example as well as by precept the methods of the bedside examination of patients, modes of treatment and the manner of diagnosis and record-keeping. With this in view an order has been placed for some of the modern instruments for making and recording such observations, such as the sphygmomanometer for examining the blood pressure, perimeter for examining the field of vision, dynamometers for testing the strength of muscle contractions, etc. From the progress which has now been made it is hoped that the work will be fairly started by the first of the new year.

[H. Douglas Singer, M.D., M.R.C.P., was born in London, England, on Jan. 7, 1875, educated at Merchant Taylors' School in London, and from there obtained a scholarship in chemistry and natural science. He entered as a medical student at St. Thomas' Hospital Medical College, London, in 1893, and graduated in 1898, receiving the usual diploma of L.R.C.P., M.R.C.S. In the same year he also graduated as a Bachelor of Medicine (M.B.) at the University of London, receiving honors in medicine and forensic medicine. In 1900 he obtained the degree of M.D. at the University of London, and in 1901 was admitted as a member of the Royal College of Physicians. In 1899 he was awarded the Bristowe medal for pathology and pathological anatomy, and in 1902 was appointed assistant examiner in medicine at the University of London. He has held the following posts: Resident House Physician at St. Thomas' Hospital, London; Assistant Superintendent of the Clinical Laboratory, London; Junior and Senior Resident Medical Officer of the National Hospital for the Paralyzed and Epileptic, Queen Square, London, 1900 to 1902; Resident Assistant Physician, St. Thomas' Hospital, 1902 to 1904. He also took postgraduate work at the Bethlem Royal Hospital for the Insane, London, and at the Hospital for Sick Children, Gt. Ormond street, London. He went to Nebraska in 1904 and practiced in Omaha as a specialist in nervous diseases until July, 1906. During that time he was on the faculty of the medical department of the Creighton University, in nervous diseases, and neurologist to St. Joseph's Hospital. In 1906 he was appointed first assistant physician to the Nebraska Hospital for the Insane at Norfolk, Neb., and also was appointed to lecture on psychiatry in the medical department of the Nebraska State University. Dr. Singer was appointed director of the Illinois State Psychopathic Institute at Kankakee on Sept. 17, 1907. He is married. Dr. and Mrs. Singer have two children.—Editor *Board of Charities Bulletin.*]

RACE SUICIDE FOR SOCIAL PARASITES.*

[Abstract.]

W. T. BELFIELD, M.D.
CHICAGO.

In 1881 there was approximately one murder for every 40,000 inhabitants in this country; in 1906, one for every 10,000. The other serious forms of social parasitism have increased in similar ratio. In the countries of Northern Europe no such increase of crime has been observed. Thus in 1906 there were in Chicago 177 murders; in London, with three times Chicago's population, there were only seventeen murders. In other words, Chicago had thirty-three murders to London's one, per unit of population.

Among the factors which encourage crime among us are the farcical maladministration of our medieval criminal laws; the notorious partnership between many criminals and many public officials; and the maudlin sentiment which has infinite compassion for the prisoner, but none for those of us who manage to keep out of jail. Thirteen of London's seventeen murderers (two escaped arrest) were hung or imprisoned for life within a few weeks after the commission of their crimes; out of regard for our city's reputation we will be silent about the fortunes of Chicago's 177. In the protection of its citizens through the swift, sure and severe punishment of their assailants—and this is the only protection ever found effectual—Chicago compares with London, Berlin or Vienna as does an ox team with an express train for travel.

With the punishment of crime we are concerned as citizens, not as physicians. But in our professional capacity we can teach the public not how to punish, but how to restrict crime, by restricting the breeding of criminals. For the hordes of social parasites who crowd our costly and ever multiplying public infirmaries breed their own kind—and the State pays the bills. Society has never placed the slightest restraint upon their propagation; qualifications for a marriage license are indeed required by a few states, but marriage is nowhere essential to procreation. Society carefully rears all its defectives—criminals, imbeciles, idiots, etc.—to breed more of their kind, and robs its worthy children to do so. The cattle breeder is wiser.

Sterilization of the male criminal by castration, though often proposed, will never meet general approval, because it destroys the subject's sexual power; and while different men worship different gods, all men worship the same goddess—Venus. But sterilization can be secured with equal certainty without the slightest impairment of sexual power or pleasure, simply by dividing the vas on each side—*vasotomy*. This little operation is performed in a few minutes under cocain anesthesia, through a skin-cut less than half an inch long; it entails no wound infection, no confinement to bed; it is less serious than the extraction of a tooth. That obstruction of this tube does not impair sexuality is abundantly proven by the robust sexual health of thousands of men who

* From an address delivered at a joint meeting of the Physicians' Club and the Law Club of Chicago, Dec. 13, 1907.

have been unwittingly sterilized through bilateral epididymitis, and who never suspect their sterility until their marriages prove barren. That vasotomy itself is equally harmless to sexuality is shown by the experience of those upon whom it has been performed; among these, within my personal knowledge, are married men who took this means, rather than criminal abortion, to prevent the transmission to offspring of their own hereditary taints, such as insanity and syphilis. The sterility caused by vasotomy can be subsequently cured by a slight operation which reunites the severed ends of the vas, should the subject ever desire to beget offspring. Irremediable sterility, such as is desired for the defective classes, is easily procured by removing a piece of the vas—vasectomy. Yet since these people seek pleasure rather than progeny, vasotomy is in practice, if not in theory, sufficient for them also.

In March, 1907, the Indiana legislature passed a bill authorizing the sterilization of "confirmed criminals, idiots, imbeciles and rapists" in the state institutions of Indiana. In the prison at Jeffersonville over 300 convicts under 30 years of age have been sterilized, some by authority of the state, but over 200 of them *at their own request*. This voluntary submission to sterilization by hundreds of convicts removes the only conceivable opposition to this method of protecting society, namely, the sentimental.

THE INDIANA MOVEMENT.*

[Abstract.]

J. N. HURTY, M.D.

Secretary of the Indiana. State Board of Health.

INDIANAPOLIS.

Degeneracy is a defect which differs from disease in that it cannot be cured. If a child is born without legs or arms this is a defect for which there is no cure. The oppression of the defect may be ameliorated by the attention of others, and that is all. Degeneracy, an incurable defect, means there is something lacking in the mental or nervous makeup. Degenerates are increasing faster than the increase of the general population. All the states are continually finding it necessary to erect new institutions for the care of the degenerate, the delinquent and the dependent. The class known as degenerates includes most of the insane, the idiotic, the epileptic, the confirmed inebriates, the imbecile, the sexual perverts, the prostitutes, the tramps, the criminals and the habitual paupers.

Education does not and cannot eliminate degenerates. There is but one way, and that is to prevent their being created. The duration of the lives of the insane, of criminals, of idiots, of epileptics and habitual paupers has been increased about eight years in Indiana in the last two decades. The average duration of life in the same period for the whole population has increased only four and one-half years. The perfect

* Read Dec. 13, 1907, before a joint meeting of the Physicians' and Law Clubs of Chicago.

care given the defective class is the cause of the increased duration of life. This increase is a disadvantage to the degenerates as well as to society in general. But sentiment demands that the care be given, and it is well for the sane and the strong that this sentiment exists. It is the good animal that makes a success of life. It takes good animals to make a nation strong and persistent. Only good human animals are wanted.

The restricting of propagation must be adopted. This is necessary to preserve the nation and even the race under the present conditions of civilization. These truths have led Indiana to adopt scientific and practical methods for eliminating the unfit. The law affecting the problem from the marriage side was passed in 1905. "No license to marry shall be issued except upon written and verified application. The form of application shall be supplied by the state board of health and said board may revise said forms from time to time as may be advisable. No license to marry shall be issued when either of the contracting parties is an imbecile, epileptic, of unsound mind or under guardianship as a person of unsound mind, nor to any male person who is or has been within five years an inmate of any county asylum or home for indigent persons, nor shall any license issue when either of the contracting parties is afflicted with a transmissible disease." The marriage is illegal without a license, and a penalty of $100 fine lies against any county clerk for issuing a license contrary to law, and the same penalty lies against any person authorized to marry who does so when the applicants have no license.

Strongly enforced, this law, without doubt, will reduce degeneracy in some degree, but will not very greatly affect the evil. The second law aiming at the prevention of the creation of degenerates is as follows:

A bill for an Act, entitled an act to prevent procreation of confirmed criminals, idiots, imbeciles, and rapists: providing that superintendents and boards of managers of institutions where such persons are confined shall have the authority and are empowered to appoint a committee of experts, consisting of 2 physicians, to examine into the mental condition of such inmates.

WHEREAS, Heredity plays a most important part in the transmission of crime, idiocy and imbecility; therefore,

Be it enacted by the general assembly of the State of Indiana. That on and after the passage of this act it shall be compulsory for each and every institution in the State, entrusted with the care of confirmed criminals, idiots, rapists and imbeciles to appoint upon its staff, in addition to the regular institutional physician, two (2) skilled surgeons of recognized ability, whose duty it shall be, in conjunction with the chief physician of the Institution, to examine the mental and physical condition of such inmates as are recommended by the institutional physician and board of managers. If, in the judgment of this committee of experts and the board of managers, procreation is inadvisable and there is no probability of improvement of the mental and physical condition of the inmates, it shall be lawful for the surgeons to perform such operation for the prevention of procreation as shall be decided safest and most effective. But this operation shall not be performed except in cases that have been pronounced unimproved: Provided, That in no case shall the consultation fee be more than three ($3.00) dollars to each expert, to be paid out of the funds appropriated for the maintenance of such institution.

The law permits castration, but vasectomy is the operation usually performed. It is simple, without the slightest danger, does not mutilate, and may be performed in three minutes without local or general anesthetic. Since October, 1899, Dr. H. C. Sharp, surgeon of the Indiana Reformatory at Jeffersonville, has operated upon 300 cases, and up to the going into effect of the law most of the men sterilized by vasectomy submitted voluntarily to the operation. Dr. Sharp says: "I have never seen any unfavorable symptoms. There is no atrophy, no cystic degeneration and no disturbed mental or nervous condition following vasectomy. On the contrary, the patient becomes of a more sunny disposition, brighter of intellect, ceases bad practices, and advises his fellows to submit to the operation for their own comfort and good."

COUNTY AND DISTRICT SOCIETIES

ADAMS COUNTY.

Regular Meeting, October 14, 1907.

The Adams County Medical Society held its regular October meeting on the 14th in the Elks' Club Rooms, Quincy, with the officers and a good attendance of members present. A committee of five was appointed to consider and plan for the taking up of the postgraduate course of study and to be ready to report at the next meeting. Drs. J. B. Shawgo, E. B. Montgomery, Baker, Ashton and Wells were named. The applications of Drs. William Zimmermann, Jr., and W. J. Meyer were received and referred to Board of Censors. After the return of the members from Hotel Newcomb, where luncheon was served, Dr. T. B. Knox read a very practicable paper on "Quarantine Regulations," which brought out a general discussion. A symposium on gastric ulcer was then presented by Dr. W. A. Garner, Clayton, Ill., and Dr. W. H. Baker, Quincy, the former taking up the etiology, pathogenesis and pathology, and the latter the diagnosis, symptoms and treatment of this disease. Both papers were very carefully prepared and were enjoyed by all and discussed by many. Dr. Garner made a clinical report of a perforation of gastric ulcer with death twenty-seven hours thereafter without operative interference. He also showed a specimen of fetal monstrosity of the anencephalic order. Dr. Frank P. Norbury, of Jacksonville, was a welcome visitor.

QUARANTINE REGULATIONS.

DETAILS FOR PHYSICIANS, PATIENT AND FAMILY.

T. B. KNOX, M.D., QUINCY, ILL.

In the light of modern bacteriological investigation the physician who fails to pay proper attention to every case of contagious disease which comes under his observation is doing the worst possible injustice to himself and the community at large. In prefacing this paper with these remarks I hope to confine myself strictly to such quarantine regulations as should be carried out by the physician. The subject of quarantine *per se* shows nothing new in the way of literature in more than ten years. However, a few reminders at this time may not be amiss.

In all cases of contagious and infectious diseases there should be a strict quarantine enforced, especially in smallpox, diphtheria, measles, scarlet fever and chicken pox. The first and most essential procedure is prevention. Every physician when called to see a case in which there is any doubt in regard to diagnosis should enforce isolation from those outside of the household until such time as he can make a positive diagnosis, then if the disease be of a contagious character he should inform the family of the danger to others from contact with the patient, clothing, pets, etc., belonging in the house, and he should caution the family against shaking rugs, etc., in the yard or hanging out clothing, bed clothes, etc., on the line in the yard unless such clothing or bed clothes have first been thoroughly boiled. It has been positively proven that dusting carpets, rugs, etc., has been the cause of some of our worst epidemics of contagious disease. After the physician has made a positive diagnosis he should at once notify the local board of health, who in turn placard the house and give further instructions to the family, and, as a rule, a pamphlet issued by the State Board of Health for each separate contagious disease is handed them.

Physicians are often careless and do not report their cases at once to the board of health and allow two or three days to pass before reporting same, and

in the meantime every child in the neighborhood has heard that little Katie is sick and all come to pay their compliments, and for their trouble carry away an army of diphtheria, scarlet fever or other germs, either on their hands, face or clothing, they in turn very liberally supplying the schoolroom or the Sunday school in the next few days, and in this way a dreadful epidemic is started which with a little judgment on the part of the physician in the start would have been averted.

It is unnecessary for me to make any mention of the various carriers or the different ways which the disease is spread, as every intelligent physician is thoroughly conversant with the facts. In houses where a quarantine is in existence no one should be permitted in or out of that house. As now is the custom, the father and sons are allowed to come and go at their pleasure. The patient should be isolated in the upper part of the house, and where this is not possible the whole family also should be quarantined, as there is no such thing as was and now is practiced here, of fumigating the persons mentioned and allowing them to go. They have already been exposed to the same contagion as the one down with the disease, but have been more fortunate in not taking the poison into their system and succumbing also.

You probably will be surprised if I state that there exists in this city, among our own profession, men who do more damage than a dozen ignorant laymen when they tell their patients that they neither believe in and refuse to use antitoxin and vaccination; such men should be sought out and have their licenses revoked. There is very little excuse now for a child to die of diphtheria. The doctors do not use antitoxin early enough or in large enough dosage. You can do no harm in using too much, but you can do irreparable damage by not giving enough. The present epidemic of diphtheria is in a measure due to the carelessness of some of you in not following proper quarantine regulations and removing same too early, also a good many of you fail to give an immunizing dose to those in the house who are unaffected, especially the children. All cases of sore throat should be looked upon with suspicion and isolated until you are sure of your diagnosis. In one room of a certain school there are eight children ill with diphtheria and three more of the same room have died in the past month. Nearly all of our present cases exist in this school district. It certainly looks as if the proper quarantine has not been enforced, and also shows that we have been careless in overlooking cases of sore throat. I have been digressing in my remarks and referring freely to diphtheria, but what applies to diphtheria applies to all contagious diseases; therefore I will close my remarks by referring in future to diphtheria.

Filth plays an important part in the spread of diphtheria, for insanitary conditions tend to lower vitality, therefore increasing susceptibility to disease. Sewer gas may also be a carrier of contagion, overcrowding, faulty ventilation, filthy conditions of habitation, damp cellars, damp houses, pets, all favor the spread of disease. Children under 15 are most susceptible, therefore all cases of sore throat in those under that age should be looked upon with suspicion and temporarily isolated; a healthy child is not as susceptible as one weakened by insanitary conditions. Diphtheria may attack a person more than once.

Every case of diphtheria or other contagious disease is dangerous to life. A delay may be dangerous to the patient; therefore, in cases of suspected diphtheria, don't wait for a report from the state board, but give antitoxin at once. It does no harm and is of positive benefit in other forms of sore throat, so you make no mistake in giving it. In cases of membranous croup, which are really laryngeal diphtheria, antitoxin is of benefit.

Diphtheria is a preventable disease. A rigid observation of the rules of the State Board of Health will often prevent the introduction of the disease and is always followed by a limitation of the disease to the first few cases. If diphtheria spreads from one house to another some one is to blame. A child is attacked with diphtheria within two or four days after exposure, sometimes within twelve hours; a child after being exposed should be carefully watched for a week or ten days and on the slightest sign of illness should be separated from the others. Keep children away from sources of contagion, do not allow them to go

near an infected dwelling or mingle with children in close proximity to an infected dwelling. During the prevalence of contagious diseases you should warn those with whom you come in contact to avoid public gatherings and the like.

Do not allow other children to use dishes, toys, etc., used by an infected child. Discharges from the patient should be destroyed. Quarantine should never be removed under two weeks. Many of you have it removed sooner, but it is dangerous. The quarantine should not be removed until after thorough fumigation of the premises. The present method of quarantine as carried on in this and other cities is pretty much a farce in allowing members of the family to roam about at will, and in places where the family obey the quarantine cats and dogs are permitted to roam the neighborhood. These pets, or rather pests, should be destroyed. The manner of disinfection as carried out by the local board is also farcical; it should either be done thoroughly or not at all, as a partial disinfection does no good whatever. Deodorants merely remove one offensive odor and replace it with another, but they do not disinfect. In one case in which I attended, the crib in which the baby lay ill with diphtheria was placed in an adjoining room while the sick room was disinfected. It is not enough to disinfect the sick room alone—the whole house should be thoroughly disinfected. If worth doing at all it is worth doing right. And in this way only will the public be protected. I would call your attention to the pamphlets issued by the State Board of Health as being worth your while to look over, giving you all the details in regard to quarantine and disinfection.

Another important point which is carried on in some of the larger cities is that of disinfecting flats and tenements after a family moves out and before another moves in, and in this way the family moving in is protected, not only from contagious diseases, but also from infectious diseases, as tuberculosis.

Regular Meeting, Nov. 11, 1907.

The regular November meeting of the Adams County Medical Society was called to order at 11:30 a. m., November 11, in the Elks' Club Rooms, by the president, Dr. J. H. Rice. Others present were Drs. Williams, W. W. and J. G.; Shago, J. B. and Kirk; Brenner, Koch Ashton, Germann, Knox, Miles, Kidd, Millen, Montgomery, Gilbert, Ericson, Lierle, Hart, Groves, A. W. Meyer, Knapheide, Pfeffer and Wells. The committee on the proposed postgraduate study reported as follows:

The committee appointed to consider and plan for a course of study in the Adams County Medical Society beg leave to report that they find the proposed course of study not advisable for the society as a whole by reason of its infrequent meetings and scattered membership. They therefore recommend that a Physicians' Study Club be organized from the membership of the society, with power to acquire property, select quarters and facilities for carrying on the work appertaining thereto. If these recommendations are approved by the society they ask for further time to perfect the plans for such an organization.

After considerable discussion, the report was received and approved and the committee given further time.

DUMB-BELL FOR INTESTINAL APPROXIMATION.

JOSEPH B. BACON, M.D., MACOMB, ILL.

(Abstract.)

The numerous methods of suturing that are described and the various mechanical devices described in recent standard text-books of surgery go to show that the ideal method for intestinal approximation or anastomosis has not been found. The new method of operating and the new device which he showed is the result of two years' original work. He began with the idea that if an end-to-end approximation of an intestine or an anastomosis of the intestine with the stomach, either where we use the severed end to make the anastomosis, or make it with a lateral union, all of the connective tissue must be incorporated in the fixation method, if we are to safeguard against leakage and get a firm safe

union. This is what Nature does when one organ becomes agglutinated to another, and ultimately becomes anastomosed as a result of septic infection. After experiments he finally succeeded in making a hollow dumb-bell accomplish the desired result. It acts simply as a hollow cylinder for the passage of liquids and gas, and at the same time gives a base upon which we can tie all the connective tissue in one firm grasp by means of a rubber or silk, or both may be used. We have a firm union for three or four days while the serosa and muscularis are becoming united by an organized lymph in their new position. In from three to four days the organized tissue is a safe barrier against leakage. The ligature necroses through the connective tissue by this time and frees the device.

This dumb-bell is made of aluminum, hence is very light. Three sizes are employed, one for children, one for adults, and the largest size for the colon. Dumb-bells made or moulded of soft rubber or any digestible material may be used in the same method. He prefers the durable, light aluminum one. He desires the connective tissue to hold for at least three days, preferably five, and in his experiments on pigs found that it was freed in from four to six days. The rubber or silk ligature should be wrapped firmly around the tissues and the dumb-bell twice and securely tied with several knots. Since the knots and the ligature material are left within the lumen of the bowel the quantity does not make any difference. The ligature material should be coarse, a rubber band about one-fourth inch broad or heavy braided silk, that it may necrose through slowly. Silk or linen in the hands of a beginner are not so safe, as any sawing motion of the ligature in its application might cut through and thus require reamputation of the gut and a serious prolongation of the operation.

Operation for end-to-end approximation is done thus: The two ends of the bowel are secured by a suture at the mesenteric border, care being taken to include in this suture the V-shaped mesenteric triangles. Directly opposite the mesentery, on the periphery of the intestine, another suture is placed. Each of these sutures are tied loosely, as they are only used for the purpose of invaginating the two ends of the bowel. Two inches from the end of the intestine along its peripheral border an incision is made through its wall one inch in length. This incision is made in the proximal end of the intestine, if it be enlarged, otherwise in the distal end. A pair of forceps is now passed through this incision into the intestine and the tension sutures secured and drawn through the incision. Now steadying the mesenteric border of the intestine between the thumb and finger and drawing the sutures invaginates the two ends of the intestine into each other and through the incision. The dumb-bell is now placed into the ends of the invaginated intestine and the ligature applied at a distance of one-half inch from the ends of the severed intestine encircling it and the handle of the dumb-bell. Disinvaginate by gentle traction and pressure upon the dumb-bell, unite the peripheral incision by a Czerny-Lembert or Gély suture, then complete the operation by suturing the mesenteric opening.

The author stated that the three sizes of the dumb-bells by the ligature method can be made to fulfill any requirement in any operation from the cardiac end of stomach to the rectum. The advantages claimed by the author for the dumb-bell device are: simplicity of this method of operating; simplicity of the operation; the absolute safeguard against leakage, as the ligature secures all of the connective tissue; the short time in which the operation can be performed; the dumb-bell cannot remain at the site of operation more than four or five days, as the connective tissue will all have uniformly necrosed by that time; the extremely light weight of the dumb-bell, its size and shape, insure against the possibility of its lodging at any part of the alimentary tract; no reinforcement sutures are necessary; the minimum amount of cicatricial tissue that ultimately remains.

The lecture and demonstration of Dr. Bacon were very much enjoyed and were profitable to the large number of medical men in attendance. On motion the society extended a vote of thanks to Dr. Bacon for his admirable address.

CLARENCE A. WELLS, Secretary.

Communications from Dr. John L. Porter, of Chicago, in regard to his lecture and clinic for December 9 were read, also letters from the state secretary. The censors made a favorable report on the application of Dr. William Zimmermann, Jr., and he was elected to membership by ballot. The applications of Drs. F. B. Parker, J. C. Steiner and W. E. Doane were received and referred to Censors. Dr. Nickerson made a motion that the following telegram be sent to Dr. Joseph Robbins, at Mercy Hospital, Chicago: "Dr. Joseph Robbins, Mercy Hospital, Chicago: Adams County Medical Society, at its regular monthly meeting assembled, sends greetings and wishes for your speedy recovery." A card from Dr. Robbins was read showing that he is making good progress following a capital operation at Mercy Hospital. After luncheon Dr. Montgomery presented the following resolution:

WHEREAS, An article of the by-laws of this society is to the effect that it is derogatory to the dignity of the profession for physicians to publish their names in connection with cases or operations in the public print or to suffer such publication to be made, and

WHEREAS, Such publication is a frequent event with some members of the society;

Resolved, That a continuation of such publication will subject such members to the suspicion of being party to the same and render them liable to discipline by the society.

The secretary was instructed to send a copy of this resolution to each member and also to the press of the city. Dr. S. H. Addison, representing the organization work of the national society, was present and made a few remarks. Also Dr. W. Williams of Harris, Mo., the venerable father of Dr. W. W. Williams, told of having witnessed in 1854 the operation of gastrostomy, and strange to relate the patient recovered.

Dr. Joseph B. Bacon, of Macomb, Ill., was the principal speaker of the afternoon and took for his subject, The Dumb-bell for Intestinal Approximation, giving demonstrations of its use and showing specimens of the gut from pigs which had been successfully operated upon.

COOK COUNTY.

CHICAGO MEDICAL SOCIETY.

Regular Meeting, Oct. 23, 1907.

A regular (clinical) meeting of the Chicago Medical Society was held Oct. 23, 1907, with the president, Dr. Henry B. Favill, in the chair. Dr. Max Reichmann exhibited (a) Kinematographic Roentgenograms of the Process of Respiration (by courtesy of Dr. A. Kohler, Wiesbaden); (b) Stereoscopic Roentgenograms, with Demonstrations by Means of the Improved Walter's Stereoscope. Dr. J. R. Pennington read a paper entitled A New Method of Ligating the Appendix within the Cecum. Dr. E. Rischar described a similar operation to that outlined by Dr. Pennington. The two papers were discussed by Drs. Ochsner, Barrett, Hessert, Ries, and the discussion was closed by the essayists. Dr. E. K. Findlay reported Two Cases of Infantile Paresis of the Third Nerve, with operation. Dr. Edward H. Ochsner reported An Unusual Case of Mixed Infection of the Hand, which was discussed by Drs. Ridlon, Hollister, Reichmann, and in closing by Dr. Ochsner. Dr. A. W. Baer reported (a) Case of Spastic Paralysis (eighteen years) Since Birth; (b) Case of Tubercular Spine, with a General Paralysis of Thirteen Years' Standing. Discussed by Dr. Ryerson, and in closing by Dr. Baer.

KINEMATOGRAPHIC DEMONSTRATION OF ROENTGENOGRAMS SHOWING THE PROCESS OF RESPIRATION.

MAX REICHMANN, M.D., CHICAGO.

In the last few years different experiments were made to demonstrate in medical lectures, before students and laymen, various pathological conditions by means of kinematographic reproductions.

Dr. A. MacLane Hamilton demonstrated by this method the different gaits, the celebrated French surgeon Doyen had different difficult operations reproduced by the kinematographic camera, causing great controversy as to the propriety of the pictures.

Dr. W. Greenough Chase had epileptic fits biographed and Dr. Levy-Dorn demonstrated at the first Roentgen congress, 1905, Roentgenograms of the knee joint, showing in kinematographic reproductions the movements of the latter. Great interest was evoked by the demonstration of Dr. Alban Köhler of Wiesbaden at the third Roentgen congress at Berlin in the early spring of 1907. The well-known roentgenologist showed by means of the kinematograph the act of breathing as it is performed inside the pleural cavity. Only a roentgenologist can judge the enormous amount of work and patience necessary to prepare the negatives. It would be an easy undertaking to make real kinematographic roentgenograms of every motion of the human body if there would be a film in existence of sufficient sensitiveness, so that the rays, going through the body and the fluorescent screen, could affect it, but, unfortunately, this is not the case yet, and therefore we must divide the motions in different phases, roentgenograph these phases separately and by means of the kinematographic camera, put them together again on a kinematographic film.

Now, just imagine the work to divide one breath into 20 or 22 phases and roentgenograph the same while the thorax is in perfect standstill in each phase, as Dr. Köhler has done in his case. Each phase was projected two or three times upon the film, so that about sixty pictures will pass your eye while you watch one respiration.

The difficulties encountered by Dr. Köhler in preparing the rontgenograms for his film were numerous, so, for instance, it is very difficult to get a number of thorax negatives from the same person while the diaphragm is absolutely still; furthermore, the exposures must be limited in number to prevent burns, but most of all is it difficult to produce negatives which will all have the same contrast and density; in fact, this last difficulty is most perceptible in viewing the picture, and one must get used to the views for a few seconds before satisfactorily comprehending the picture.

The technic in all the exposures was as follows: Thorax of a woman. Ventrodorsal exposure of twenty seconds with a focal distance of 75 cm.

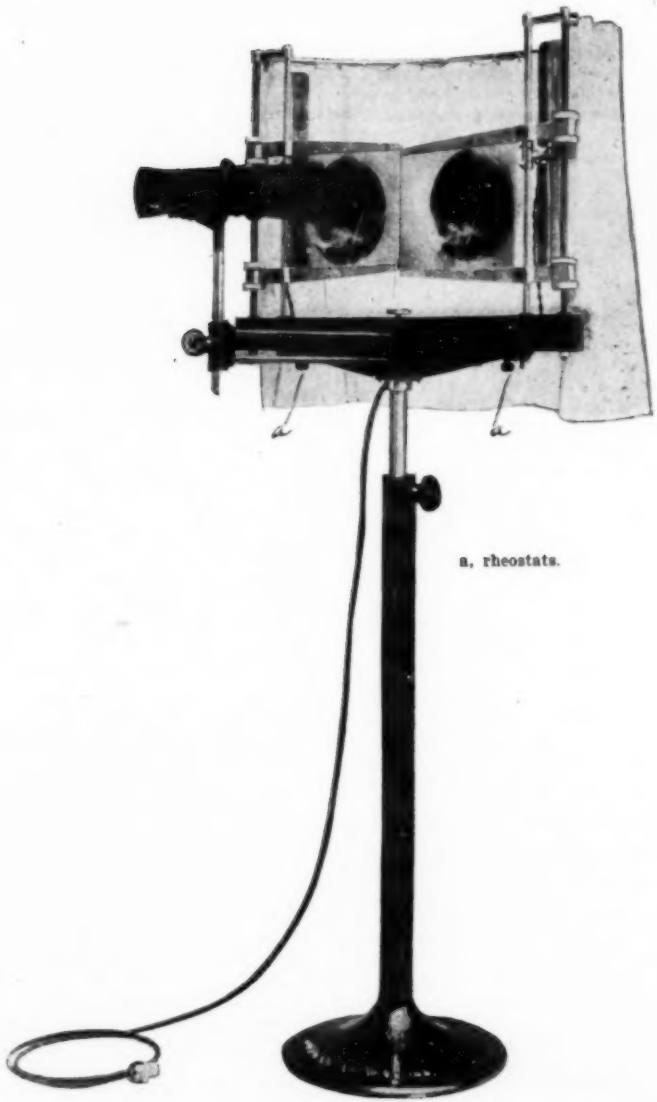
STEREOSCOPIC ROENTGENOGRAPHY.

MAX REICHMANN, M.D., CHICAGO.

Ever since Roentgen made his wonderful discovery, the desire of all the investigators in this field was to produce stereoscopic views by which one would be able at a glance to distinguish, for instance, the position of the fragments in a case of fracture, to calculate the position of a foreign body, to recognize the relative position of the femur and the coxa in a case of dislocation of the hip, etc.

As early as 1897, Professor Mach, in Vienna, made stereoscopic Roentgenograms of the hand, to be followed very soon by Levy-Dorn,[1] who exhibited the first stereoscopic Roentgenograms at the Congress of the German Surgical Society, 1897; Hildegrand,[2] who constructed the first box for exchanging plates without moving the patient; Lambertz,[3] Walter,[4] who constructed a prism stereoscope, by means of which the original plates could be viewed; Lossen,[5] Matthias,[6] Becker,[7] Köhler,[8] Gillet[9] and Drüner,[10] who published very scientific calculations for measuring the position of a foreign body in a stereoscopic view; Hildebrand, Scholz and Vieting,[11] who published a very instructive collection of stereoscopic Roentgenograms. A complete method of making stereoscopic Roentgenograms is given by Albers-Schönberg[12] and by Goeht[13] in their works on Roentgenography. In connection with this complete German literature on the subject, I might mention the articles by Boas[14] and Reiniger, Gebbert and Schall[15] on stereoscopic examination with the fluoroscope.

The contributions in the English language on our subject are very meager indeed. James MacKenzie Davidson[16] is one of the earliest workers in this field,



a, rheostats.

Dr. Walter's Prism Stereoscope, Modified by Dr. M. Reichmann.

also William A. Cotton.[17] A very interesting article was written by Feiss.[18] Williams,[19] Carl Beck[20] and Caldwell,[21] in their respective works on Roentgen rays, mention the stereoscopy in a cursory way only.

Among the French authors Béclére,[22] Marie[23] and Ribaut[24] deserve to be mentioned.

After a careful perusal of all the literature available, I have come to the conclusion that the method of making stereoscopic Roentgenograms, as it is described by Albers-Schönberg, is the most practical one, and I therefore shall follow this method with slight modifications in describing this important chapter of our art. Besides the usual Roentgen instruments, we need for stereoscopic views the following appliances: Plateholder, tubeholder, stereoscope.

PLATEHOLDER.

As we can not take a stereoscopic Roentgenogram in one exposure, as it is done with the stereoscopic camera, we must use two plates in succession, and it is of the utmost importance that we can change our plates without disturbing in the least the parts which are resting upon them. Hildebrand was the first one to construct such a plate receptacle, but it is rather bulky and not very easy to handle, and Albers-Schönberg substituted for it a box into which another box containing the plate can be easily inserted. In taking up Albers-Schönberg idea I have constructed a device, which in my opinion will save the operator a good deal of time and annoyance.

An ordinary photographic plateholder, divided by cardboard, can be armed with two plates at the same time. Instead of the cardboard I inserted a snugly fitting piece of sheet-lead, or still better, a piece of the well-known ray-proof combination of rubber and lead. In the dark room plates are now inserted on both sides of the lead-plate with the emulsion side outward, the black cardboard to protect the plates from light put in place and the whole frame inserted into a wooden box, which it fills completely. The parts to be examined are now placed upon the box, kept steady there either by bandages or by means of a compression diaphragm, and the first exposure made. For the second exposure the frame is taken out, turned upside down, inserted again in the box and the second plate is ready for exposure. On the top of the outer box the size of the plate contained in the plateholder is exactly reproduced, so that it is a very easy matter to place the object directly in the center. I have found this arrangement a very useful one.

POSITION OF THE TUBE.

It is well known that in order to produce a stereoscopic effect by two Roentgenograms, two exposures have to be made with the anticathode in the first exposure and the anticathode in the second exposure placed not more than 3½ cm. in a horizontal line, either way from the middle of the plate, i. e., the average distance between the axes of both eyes. The simplest way to accomplish this is by means of a crossbar which can be fastened upon the table and which is provided with a tubeholder sliding above it in either direction. The tube is first centered upon the middle of the object to be examined, and therefore upon the middle of the plate, then for first exposure shifted 3½ cm. to one side and for the second exposure 3½ cm. from the starting point to the other side.

This distance of 7 cm. between the two positions of the tube is theoretically incorrect, as Marie and Ribaut have shown, because the distance should be brought into a certain proportion with the thickness of the object, and Marie and Ribaut have compiled a table giving their proportions. But for practical purposes I have found that 7 cm. is best suited for a stereoscopic view of the hands and other thin parts of the body, while for thick parts like thorax, pelvis and hips a distance of 2-3 cm. is quite sufficient.

Albers-Schönberg has greatly facilitated the displacement of the tube by adding a sliding attachment to his compression diaphragm, so that the hard rubber ring at the bottom of the cylinder only is absolutely steady, while the latter can be turned to each side as far as it is necessary. The distance of the displacement is measured upon a scale and the cylinder can be fastened in every

position by means of a screw. To get a correct stereoscopic view it is essential that the central ray of the tube should strike the same place upon the plate in both exposures, and this can only be accomplished by moving the whole compression diaphragm upon its frame a little in the same direction as the cylinder alone was shifted. But for practical purposes this can also be omitted.

In brief, the technic in making stereoscopic views by means of the compression apparatus of Albers-Schönberg is therefore as follows:

Place the part to be examined in the center, of the box containing the plateholder, adjust the cylinder so that its axis will go through the center of the part; then after putting a thick pad of absorbent cotton upon the part compress as much as the patient can bear, turn the cylinder to the left, according to the thickness of the body, not exceeding 3/5 cm., put the board with the centered tube on top of the cylinder and expose according to the ordinary rules. Then remove plateholder and turn it upside down, insert it again, shift cylinder again from Mark O to the right, same distance as before, adjust tube and expose; care to be taken that the time of exposure in both instances is the same and the vacuum of the tube not to be altered to any extent. Still more simplified is this method if the cylinder in the first exposure is held vertical upon the object, and for the second exposure is shifted 2-3 cm. to the right or left. The views so obtained are, so far as stereoscopy is concerned, very satisfactory.

STEREOSCOPE.

After the plates are carefully developed a mask of black paper is put around the picture proper in order to exclude all reflection of the illuminating light, and the plates can now be viewed by means of any of the numerous stereoscopes in the market, care being taken to have the film sides look toward the observer. I prefer the prism stereoscope as constructed by Walter; the prisms are achromatic, can be turned completely around, so that each subject can be viewed from the front and back without changing the plates. I have devised a modification of the Walter instrument, which enables me to raise the pictures always to such a height that the centers of the two pictures are in one plane with the centers of the prisms; furthermore, an electric light attachment is added to the instrument by means of which a homogeneous light, which can be adjusted by a pair of small rheostats, is always available. It is well to know that the plates have to be inserted into their frames in such order, that the plate taken with the cylinder shifted to the right is placed on the left side, and *vice versa*. I have inserted into the instrument two plates of a patient whom Dr. John Ridlon referred to me.

The young man got his hand into a threshing machine, and as you see upon the dorso-palmar Roentgen negative, he sustained severe fractures of the second, third and fourth metacarpal bones. That the fragments were very much dislocated you can notice by looking at the lateral negative, but a most beautiful picture of the conditions you will get by looking at the pair of dorso-palmar negatives taken with the stereoscopic cylinder, and after having done this, I am sure that none of you will have his fracture cases roentgenographed in a different way.

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NEW METHOD OF LIGATING THE STUMP OF THE APPENDIX.

EDUARD RISCHAR, M.D., CHICAGO.

Nearly every operator has some modification or a method of his own for the treatment of the stump of the appendix. That very fact would lead us to believe that almost any treatment of the stump is safe, or that we are still searching for a better method. Judging by journal reports and society discussions, the latter must be true.

Many operators, and with a just reason, object to placing a silk ligature away from a normal exit. We also know that a ligated stump, part uninvaginated within itself, is not ideal surgery. If invaginated unligated, it is liable to hemorrhage. To overcome these objections, I have devised the following method and demonstrated same in the operative surgical department of the Chicago Policlinic.

To invaginate the stump of the appendix entirely and to encircle it with a ligature within the cecum, to prevent bleeding; having freed the appendix and disposed of the meso-appendix, as usual, the appendix with slight traction is held away from the gut by the assistant. The gut is entered with a straight, round and preferably not too sharp needle, with silk ligature, at the base of the appendix opposite the meso-appendix. The base is divided into thirds. The needle exits at the angle of the first third. A forcep is applied to the ligature to act as a holder. The needle re-enters its exit, but including a slight amount of the muscular and mucous membrane of the first third, to act as anchorage for the suture and loop "A" is formed. The needle now proceeds to the angle of the second third which is made the same as the first third and loop "B" is formed. Our needle re-enters the same as before, including musculature and mucous membrane of the second third; exits at the same point of first entry, making the last third, and we now have Figure 1.

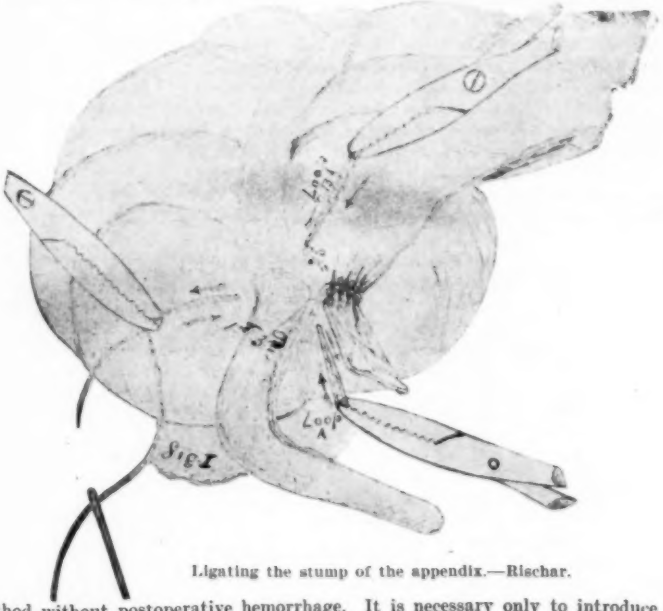
With the three forceps on the exposed sutures, the structures are held in position, the appendix is cut off and invaginated. The forceps are now removed and the slack of the loops taken up, and now we have Figure 2. We now push the invagination still lower and tie. If for reasons you do not want to enter the lumen of the gut, only enter to and keep the needle running between the mucous membrane and muscularis, coming out at the angles same as given above. The whole is covered with external catgut Lembert suture. The meso-appendix is disposed of as usual.

Dr. Pennington read a paper on A New Method of Ligating the Appendix within the Cecum.

DISCUSSION ON PAPERS OF DRS. RISCHAR AND PENNINGTON.

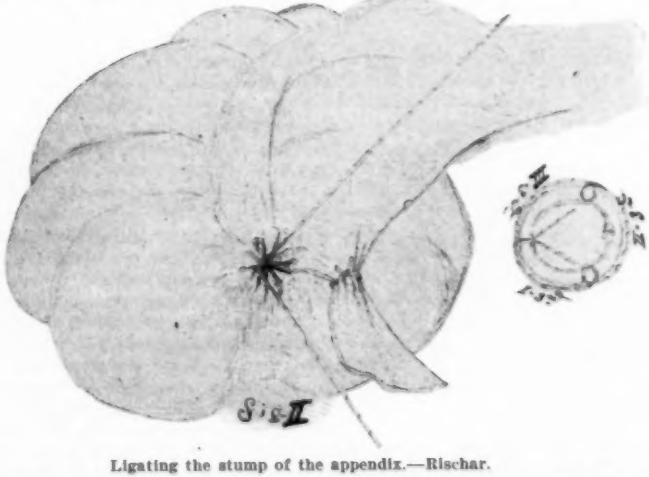
Dr. A. J. Ochsner:—The ingeneous methods that have been described should not go without discussion, especially as they seem to illustrate a surgical principle which demands that every useless method should at the same time be harmless.

Since Dr. M. L. Harris of this society introduced his very simple method of treating the stump, thousands of appendices have been safely removed by following his directions. I have myself removed more than 2,000 appendices by this



Ligating the stump of the appendix.—Rischar.

method without postoperative hemorrhage. It is necessary only to introduce the purse-string suture so that a portion of the stitch is placed entirely around the



Ligating the stump of the appendix.—Rischar.

point at which the vessels of the mesenteriolum enter the appendix in the form of a carefully applied loop and to place each stitch of the entire purse-string suture deeply enough to make sure that the point of the needle is engaged in the

submucous connective tissue. The latter step is important in order to prevent oozing from the edges of the appendix which may occur if the purse-string suture is taken too superficially. A second row of Lembert's sutures, which grasps the end of the stump of the mesenteriolum, is advisable to dispose of this raw surface.

Dr. Channing W. Barrett:—In connection with these papers, I wish to present a simple method of closure which I have used for a number of months, and which seems to answer the purpose. The principle of turning in the appendix and having it safe is based on getting a suture deep enough so that very little of the appendix structure is inside of the suture before it is turned in, and a great deal of the appendix structure is outside of the appendix before it is turned in, so that when it is turned in the thing that is outside is on the inside.

Let this illustrate a cross-section of the appendix (indicating). You pick up the appendix, you start in on one side with the needle, going sufficiently deep into the structure, not entering the coat, and coming out on the other side. There is very little of the structure of the appendix on the inside of the suture; it is nearly all on the outside. The blood vessel in the stump is on the outside. You put a clamp about the appendix above the suture, crush it, cut it off, and you are ready to turn that inside. It is not a question of bothering with ligatures when you turn it inside. You turn the appendix in and the suture is in the wall of the appendix. When it is turned in you draw on that (indicating), and as a means of turning that in, when it is not tied, I have an appendix tucker. Boldt devised an appendix tucker with a needle on it; Mayo gave it a handle, and I have given the handle a useful end. This crosses the rim made with the forceps, and instead of carrying one down it carries them both down. There are two points, one to go on one side and one on the other. These rough sketches illustrate the suture.

Dr. William Hessert:—In the operation of appendectomy the chief point to bear in mind is the prevention of hemorrhage. I read a paper before this society last year in which I reported three cases of hemorrhage from the appendix, one of which ended fatally, all of the operations having been done by the usual inversion method without ligating the stump. I endeavored to find out in the last year whether there were any ill or unfavorable results from tying the appendix off and dropping it back, and I could not find any one who had any bad results.

The methods of Drs. Pennington and Rischar are too complicated, as Dr. Ochsner has said. Furthermore, I do not believe the method of Harris is safe. I have seen that method used a number of times, and it has been necessary for the surgeon to whip the catgut over and over before hemorrhage will stop, so that passing a loop around the artery, as Harris suggests, does not stop hemorrhage, and personally I would not be operated on by that method. The only safe method to guard against hemorrhage is to crush the appendix and ligate it carefully, and the little stump can be turned in with a simple circular Lembert suture, and that is all there is to it. I do not believe these complicated methods are going to be followed. The main point is to guard against hemorrhage, and the only way to prevent it is to throw a ligature around the stump.

Dr. Emil Ries:—If everybody says something in favor of his own method, I think I may speak in favor of mine. (Laughter.) I published a method (*New York Medical Journal*, July, 1903) which can be carried out without any special instruments. All you need is needle and thread. It is an inversion method, which has the great advantage over other inversion methods, whether the inversion is done by needle and thread or not, of securing any bleeding point better than any other method. Why? Because with all the other methods you have heard of, which invert, we always hear about the operator putting a clamp over the stump of the appendix. With that clamp he compresses the appendix, and therefore at that moment there is no hemorrhage. But from our experience with the angiotribe, we know that clamped arteries are liable to bleed later on, and it is not rational to take a part of the appendix, clamp it, and then invert, because in inverting you separate the parts which have been clamped at first, and therefore the risk of hemorrhage afterward is great. I never clamp the appendix where

I cut it off. I clamp that part which is to be cut off, but the part that is to be inverted is cut off without being clamped. If, then, a vessel should bleed, you can see it at the moment you cut it. Instead of passing my suture with the knot, I pass the thread around the bleeding point and catch it, after which there is no possibility of hemorrhage. This suture disappears on the inside of the cecum. I have done approximately 200 of these operations, and have never had hemorrhage. I have had a number of cases in which I could demonstrate this bleeding point on the table, and how to secure the bleeding point. I thought I would remind you, therefore, of the advantages of my method. It is not patented.

Dr. Rischar (closing the discussion on his part):—With reference to the method being complicated, I will state that whenever demonstrated it is always pronounced most simple and effective.

Dr. Pennington (closing the discussion):—Dr. Ochsner ended his remarks by saying, "It is all nonsense," his remarks having reference to the operation I have described. We all recognize Dr. Ochsner's ability as an operator for appendicitis. Nobody questions it, but there are other men who are good operators who differ with him, and would not allow the method of operating he has described to be used on them.

At the meeting of the American Medical Association, held at Atlantic City this year, when Dr. Wyeth read his paper and expressed his fear of hemorrhage following appendectomy, and described how he ligates the appendix, it was then I began to think about this matter. At the meeting of the Mississippi Valley Medical Association, recently held at Columbus, Dr. B. Merrill Ricketts of Cincinnati reported a number of cases of hemorrhage which he had collected from different surgeons following appendectomy. I attended that meeting, and after he had finished his paper it occurred to me that some method could be devised whereby hemorrhage would be guarded against. When I returned to Chicago I tried the method I have described to you on a cadaver. It is not a difficult operation to do; but it requires a special needle with an eye in the point of the needle; anybody can do it, it seems to me. Of course, I am not doing this kind of surgical work, and those who are doing operations for appendicitis continually know more about the subject than I do. (Here Dr. Pennington illustrated the simplicity of the operation on the blackboard.)

With reference to the circulation, as one of the speakers remarked, this vessel is always in the mesentery; but there are vessels at other points. If the blood supply of the appendix is always the same, then we could devise some method of catching the bleeding point, controlling the hemorrhage, and would not have any further fear about it, but the supply of blood to the appendix varies.

Dr. E. H. Ochsner reported An Unusual Case of Mixed Infection of the Hand.

DISCUSSION.

Dr. John Ridlon:—I want to emphasize one point brought out by Dr. Ochsner, and that is the relation of so-called syphilitic joint disease, whether dactylitis or other joint disease, to tuberculosis. For years we have seen joints which clinically were tubercular joints, but they appeared to have arisen either from personal or inherited syphilis; they recovered under antisyphilitic treatment more rapidly than we could have expected them to recover had they been pure tubercular joint diseases. Of the ten or twelve cases I reported at the last meeting of the American Orthopedic Association, treated by the opsonic method, at the Home for Destitute and Crippled Children, one was a case of personal syphilis, and the other of inherited syphilis, and where I believed the joint disease to be syphilitic. One, a man with personal syphilis, had an ankle joint disease that recovered rapidly under rest and antisyphilitic treatment. Two years later he developed disease in the other ankle. The other case, a child, had the multiple joint disease of inherited syphilis. Both cases showed the typical tuberculo-opsonic index. There is no question but what the so-called syphilitic joint disease is not of that nature, but is tubercular joint disease grafted on a syphilitic patient, and the reason it recovers under antisyphilitic treatment more rapidly than a tubercular joint is because the resistance to tuberculosis is increased by antisyphilitic treatment.

Dr. John C. Hollister:—There is one point which should be emphasized in connection with this paper, and that is the fact that there is a normal tuberculo-opsonic index, and that this normal tuberculo-opsonic index lies between certain boundaries, and if we find an individual after three or four successive examinations shows indices outside of these boundaries, the great probability is that he or she has tuberculosis. The more experience we have in this work, the more we develop our technic in the laboratory, the more we find this to be true. We may reasonably say to-day that if a patient has below .8, or, on the other hand, above 1.2, in one or more instances out of four or five, it is a strong indication that the person has tuberculosis.

There can now be no question as to the clinical value of combining vaccine therapy with surgery. Experiment has proved the fact. The results along the lines of chronic localized tuberculosis, localized staphylococcus infections, boils, carbuncles, have been excellent.

Dr. M. Reichmann:—I would like to ask Dr. Ochsner if the Roentgen ray was used in this case, because it is known that the rays have an appreciable beneficial effect on tuberculosis of the skin, and for the sake of diagnosis I should think it would be a good thing to try it on such affections.

Dr. Edward H. Ochsner (closing the discussion):—We examined the whole right upper extremity with the fluoroscope to determine if possible whether there was any bone lesion, but not finding any, no further use of the *x*-ray was made in this case.

I expected some discussion on the diagnostic value of potassium iodid, and I wish to repeat that I do not think the fact of tolerance or non-tolerance to the drug is of any value in differential diagnosis of syphilis from any other infection. If a patient takes potassium iodid well it does not necessarily mean that the patient has syphilis. If it causes severe intestinal disturbance or inflammation of any of the mucous membranes it often simply means that the drug is either not given right or that it is impure. We know that pure potassium iodid is an expensive drug, costing wholesale a little more than half a cent a grain. In the manufacture of potassium iodid it is difficult and expensive to remove the last traces of iodate and it is this slight trace of potassium iodid which is present in so many of the samples found on the market that causes the irritation of the mucous membranes no matter whether syphilis is present or not. I have had a number of cases who had undoubted syphilis, but who showed marked intolerance to the ordinary commercial iodid who subsequently took large doses of the absolutely pure drug without the slightest disturbance.

Dr. A. W. Baer reported (a) Case of Spastic Paralysis (18 years Since Birth); (b) Case of Tubercular Spine, with a General Paralysis of Thirteen Years' Standing.

SPASTIC CHOREA.

A. W. Baer, Ph.G., M.D., Chicago.

This boy, who had a normal birth, is now 19½ years old, and has been under observation twenty months. You see him hold his left hand open quite easily, and when not irritated can stoop and pick up a broom with his right. The most he could do before treatment was to get a fork in his left hand, dig it into a piece of bread or meat and get his face down to it. Now he does everything for himself but tie his shoes and button his clothes. He cares for a horse and drives one where traffic is light. His speech, which was almost unintelligible, is now quite distinct. Locomotion is improved to such an extent that shoes which formerly lasted one month with a half soling, now last six months. The contracted flexor muscles of the arms have relaxed greatly, doing away with the hard knots on them. The second case is one of caries of the spine, followed by infantile paralysis. This boy of 15½ years, who was taken sick at 13 months of age, was treated by every known means in the forms of casts, braces, and general instruments of torture. When he came under observation at 13½ years, he could sit up and lie down. His legs were useless, no movement and little sensation, the left arm had

a radial paralysis (for which the flexor tendon of the thumb was severed) and a generally weak arm; the right had some strength, supination and pronation, but not complete extension, because of a tubercular process of the humerus two inches from its distal end (shown in the radiograph) and including the elbow joint. The scoliosis is so pronounced that the left leg is two and a half to three inches shorter than its fellow; he sits on the right nates because of this great curvature, and you will notice in the radiograph of the pelvis shown here, that the right innominate bone is quite flat from pressure. This boy helps himself in every way; discarded his brace, can get on a chair from the floor or his bed or rolling chair, in which he goes out alone, a great difference from twenty months since, when he

had to be carried everywhere. He gets around on his hands and knees and if he continues, will be able to get around on crutches. Outside of a little medicine for a special purpose, these boys have had nothing but electrical treatments, the constant and static currents and a little *x*-ray.

The accompanying photographs show plainly some things the boy can do for himself and the *x*-ray shows the bone disease in the elbow.

DISCUSSION.

Dr. Edwin W. Ryerson:—The first case reported by Dr. Baer is interesting because of the severity of the spastic paralysis; otherwise, it is not particularly remarkable. It would have been greatly improved by a surgical operation directed

to the relief of the spasticity, the adduction and the flexion contractures particularly. This second case, given in the program as one of tuberculous spine, would be very interesting if it were a case of tuberculosis of the spine, but it is not. It is a case of infantile paralysis of considerable severity, and I do not think electricity has had much to do with the "great improvement."

Dr. Baer (closing the discussion):—I know what the feeling is as regards electricity in treating this and other classes of cases. If Dr. Ryerson will examine the elbow of this patient and tell me what the original trouble was there, and why the boy had such a deformity, I will be obliged to him. But this deformity is much less to-day than it ever has been. Some six or eight months after treating him the mother came to my office and said the boy would not wear his brace, and I said it would give the muscles of the back a chance to develop and to straighten, and I must say that it is straighter to-day without a brace than with it.

Meeting of Oct. 30, 1907.

A regular meeting was held Oct. 30, 1907, with the President, Dr. Henry B. Favill, in the Chair. There was a symposium on Opsonins. Papers were read as follows: 1. General Considerations of Phagocytosis and Opsonins, by Dr. Ludvig Hektoen. 2. Virulent Pneumococci and Opsonins, by Dr. E. C. Rosenow. 3. Bacterial Vaccine Therapy, (a) in Tuberculosis, by Dr. Mary Lincoln; (b) in Gonorrhea, by Dr. Ruth Vail; (c) in Staphylococcus Infections, by Dr. Grace Frith-Hagens; (d) Clinical Results, by Dr. John C. Hollister. The symposium was discussed by Drs. Dodd, Keating, McArthur, Ridlon, Ochsner, Herzog, Hamilton, Dagg, Butler, and in closing by Drs. Hektoen, Lincoln, Vail and Hagans.

DISCUSSION OF THE SYMPOSIUM ON OPSONINS.*

Dr. L. L. McArthur:—There remains but little to say after the exhaustive manner in which this subject has been presented, yet I feel that a few words can be said with advantage concerning the thoughts which came to me while listening to the papers.

First, it might be inferred from the paper presented by Dr. Hektoen that the opsonic index is not an accurate guide either as to diagnosis or as to therapeusis. Were any further argument needed than that presented by Drs. Lincoln, Vail and Hagans in corroboration of prior investigations, we would find it in the beautiful charts presented (with lantern slide demonstrations) by Dr. Hektoen himself. They illustrate graphically how the index is influenced by organisms and vaccines, also how it enables us to follow the changes thus induced. You have graphic tables of temperature curves, of pulse curves, and of respiratory curves. You will find them of advantage. It is of similar advantage to plat a curve for the opsonic index for the specific organism which one is studying. When the question of leucocytosis came up in its relation to surgical infections, there was shown at first, by some, a decided doubt as to its importance, yet there came a time when it was generally adopted as one of our means of diagnosis and guide as to treatment. So, too, I think we will find it in regard to the opsonic index. It is not accurate to the third decimal point, but it is sufficiently accurate to enable us to have a guide that will not depend upon the mere clinical statement of the patient or the crude clinical findings that percussion, auscultation or physical examination may give. Let us, then, act in accordance with the light we have until we have something better.

Going back to the question of leucocytosis, Brewer has shown that while the leucocytic count is significant, it is not nearly so significant as the leucocytic count which takes into consideration the relationship between the polymorphonuclear leucocytes and the ordinary leucocytes, and when the polymorphonuclear leucocytes are rising with a regular rise, it is of far more significance, and a far more virulent infection obtains, as found clinically, than when the leucocytic count is rising and the polymorphonuclears are staying nearly horizontal, as not infrequently may obtain. So with the opsonic index improvements will surely be made.

* For articles read in this Symposium, see pages 9, 13, 19, 23, 25, 28.

In closing, I wish to say that it would be an enlightenment to us if Dr. Hektoen would explain to those present how the vaccine's influence is exerted on the immunity process by vaccines introduced hypodermically. There seems to be a growing opinion that it must be through the influence of the local normal cells with which the dead vaccine comes in contact, no other means being yet at hand to explain why a system flooded with micro-organisms still has its opsonic index raised by the addition of dead organisms hypodermically.

Dr. John Ridlon:—In connection with this symposium I wish to speak of some cases of chronic joint disease that were treated at the Home for Destitute and Crippled Children. Dr. Hollister and I selected some ten cases which were treated regularly from December 14 to May 1 by vaccine therapy; some of them have received the treatment since that time. Two cases were selected by us that had been growing steadily worse for some months, and might be expected to die within less than a year, to determine if this treatment would save their lives; one has gained and the other has not lost. We wanted to know what influence this vaccine treatment would have on discharging tubercular sinuses. We found that these sinuses would not close up any more rapidly than sinuses could be expected to close in patients in equally good health without vaccination. We wanted to know what would be the effect on beginning tubercular abscesses arising from tubercular joints. We have found that these abscesses went on more rapidly to enlargement and development, with spontaneous openings, than we could have expected them to have done without the vaccination treatment. We wanted to know what would be the effect on the appearance of abscesses in tubercular joints where abscesses could be made out. I am of the opinion that abscesses appeared in some of these cases which would not have appeared had the patients not had vaccination treatment.

There was the question as to the diagnosis of tubercular joint disease. Dr. McArthur and Dr. Hollister were of the opinion that in the opsonic index we had a certain harmless and valuable means of diagnosis of tuberculosis in all cases. Perhaps they think so now, but I do not feel so sure of it, for we have one patient, a girl, with hip joint disease, in good physical condition, who had been under my care for five years, but at that time had two tubercular sinuses and had had a previous one which had closed. In this case the opsonic index was so nearly normal that Dr. Lincoln, who made the examination, thought it was not necessary to make the vaccinations. The other case was one that came to us with rachitic knock-knee, who, after an operation, performed by my colleague, Dr. Wallace Blanchard, an osteoclasis, and some accidents from falling out of bed at home after leaving the institution, developed a chronic condition of the knee-joint, the nature of which was not certain. The joint was stiff, somewhat swollen, and tender. This got better, and got worse. There were other accidents, and it was a question as to the diagnosis. The opsonic index in this case, again, was so nearly normal that Dr. Lincoln did not think it was a case of tuberculosis. Later on, Dr. Hollister excised a considerable part of the knee-joint, and found the tissue to be tuberculous, and there is to-day, after several months, a tubercular sinus in spite of the vaccination treatment, so that I believe we cannot absolutely depend upon the opsonic index as a means of diagnosis of tubercular joint disease in all cases.

There was one other point I spoke of at the meeting of last week, namely, the opsonic index in chronic joint disease associated with syphilis, which we have been accustomed to call syphilitic joint disease, because it improves more rapidly under antisyphilitic treatment than does ordinary tubercular disease. One patient, a man, whom we suspected of having had syphilis, developed disease in the right ankle joint from a slight injury, and after a year's treatment by immobilization and antisyphilitic treatment he recovered from that joint disease. Two years afterwards, following a slight injury, he developed chronic disease in the other ankle like unto the first, and at about the same time he developed symptoms of locomotor ataxia. The joint disease was syphilitic, in my opinion, but he gave a typical tuberculo-opsonic index. The other was the case of a child with multiple

joint disease in which I believe the syphilis to have been inherited. The child also had the typical tuberculo-opsonic index.

We must therefore conclude either that the tuberculo-opsonic index is not diagnostic of tuberculosis in all cases, or that the so-called syphilitic joint disease is not syphilitic but tubercular.

During the first three months the head nurse at the Home for Destitute Crippled Children has observed all the patients suffering from tuberculous joint disease for purpose of comparison. Here is her report:

DR. JOHN RIDLON, CHICAGO, ILL.

Dear Doctor.—In reply to your request for a report of those tubercular patients under treatment in the Home for Crippled Children, I have had these under my care for the last three months.

NO TUBERCULIN.

Stewart, hip joint. One sinus. Closed completely.

Eddie, Pott's. Three sinuses. Free discharge, malodorous. All completely closed.

Elmer H., Pott's. No abscess. Kept in bed. Is now out of bed and running around.

Sam, Pott's. Five sinuses. Free discharge. Four now closed. Remaining one almost well.

Jake, hip joint. One small sinus. Almost completely closed.

Charlie, hip joint. One small sinus. Improved.

Annie, Pott's. Three sinuses. Two closed. Other one almost well.

Margaret, hip joint. Two sinuses; an abscess has developed in the last month; other sinuses remain the same.

To sum up there has been marked improvement in all the cases but one.

HAVING TUBURCULIN.

About once a week recently. At first it was given more frequently.

Robert S., hip joint. No abscess.

Walter, Pott's. Two sinuses. Amount of discharge decreased.

Rosy R., Pott's. Condition remains same. No abscess development.

Eugenice, hip joint. Small sinus. Healed completely.

John, Pott's. Less discharge at times.

Henry, Pott's. New abscess formed. Discharge of pus very free and malodorus. from old sinuses. Not doing well.

Robert L. Splinters of bone coming from sinus. No change otherwise.

Elmer L., hip joint. Abscess. Died of tubercular meningitis.

William. One sinus, improved, often discharging more freely than at first, bad odor, have to change cast frequently on account of it.

Fanny. Two sinuses, unchanged, discharge free.

Tom, Pott's. Has developed two abscesses, both large and discharging freely, not doing well.

Of the eleven having tuberculin four have improved, three have remained unchanged; one died, and three have grown worse.

Respectfully submitted,

E. F. DAWSON.

Dr. E. H. Oschner:—In discussing this subject let us not be carried away by the enthusiasm that is now prevailing, but let us remember that in the treatment of these cases the Wright vaccination treatment should be simply the handmaid to the other well recognized forms of treatment. Any physician in treating, let us say, one hundred cases of tuberculosis and depending for his results on this method alone would encounter frequent defeats and many failures. There are many things in the treatment of tuberculosis which, I believe, are more valuable than the Wright vaccination treatment when employed alone. I believe, however, that in difficult cases, cases complicated with sinuses, secondary infection or other complications the vaccination treatment is of great assistance.

In the past year we have had something over seventy cases of joint and bone tuberculosis in which we used this form of treatment in addition to the other recognized measures, and I feel that we can truthfully say that these cases thus treated have improved faster than a similar number of cases treated by the other measures alone, before the introduction of the Wright vaccination treatment.

There is one very remarkable thing about this method of treatment that I have been able to observe in quite a number of cases. We know that the method of cure adapted by Nature in curing tuberculosis is a process of exclusion. The tubercular focus is surrounded by connective tissue, encapsulated, the blood supply cut off more and more and the tubercular process is practically starved out. In the cases which have been treated by the vaccination treatment in conjunction with the other methods we find that instead of an increase of connective tissue in the capsule, the connective tissue capsule has been practically absorbed.

I have had three cases of bilateral tubercular glands of the neck in whom I operated on one side before the vaccination treatment was begun and then operated upon the other side after they had received the vaccination treatment for several months. In each case the first set of glands removed were inclosed in strong fibrous capsules, while in the second set of glands the fibrous capsules had completely disappeared. The normal process of curing tubercular glands seems to be accomplished by fencing them in, so to speak, by strong fibrous tissue and then keeping the tubercle bacilli out of the circulation, while when vaccine therapy is employed it seems as though the fence is being torn away, in order to let the leucocytes devour them. In tuberculosis of the joints this difference in the healing process may be of the very greatest importance. It is the formation of connective tissue within the joint that is the principal cause of ankylosis and if we can prevent this excessive connective tissue production we ought to have less ankylosis in our joint cases, and I am firmly convinced that in the cases of joint tuberculosis which we have treated during the past year by the vaccination treatment there is actually much less ankylosis than in those cases treated before the vaccination therapy had been added to the other recognized forms of treatment. If this observation is correct, as I feel certain that it is, then vaccine therapy is unquestionably indicated in all cases of joint tuberculosis. At the present time there seems to be three great dangers from the use of vaccination treatment. First, the danger of using it without any attempt at reading the opsonic index. Second, when the first opsonic index is read by one who is inaccurate. Third, when the opsonic index is simply guessed at. The first and the last can be easily avoided, but the second is a real danger. We have tried to teach six assistants to read the opsonic index. Of these six, only three have been sufficiently accurate.

Personally, if I had a tubercular joint I would want it treated by vaccine therapy in conjunction with the other well tried and suitable methods, but I would want to be absolutely sure that the person who is reading the opsonic index knows his business, that he is accurate and reliable and that he is not guessing, because up to the present time the reading of the opsonic index is the only reliable way by which we can differentiate between a therapeutic and a poisonous dose of the vaccine.

Dr. Maximilian Herzog:—There is probably not a city in the world to-day, with the possible exception of London, where there has been so much opsonic work done as right here in Chicago during the last year. We are all doubtless aware that Dr. Hektoen, his associates and assistants, have for a number of years been carrying on work in opsonins, and long before the practical application of them was thought of here in Chicago. The credit for bringing the work forward from the clinical and therapeutical standpoint is due to Drs. McArthur and Hollister, who have for a year or more pushed it with admirably well directed energy. They are certainly largely responsible that so much work of this kind has now been done in this city.

The first question that arises is, are the sources of error in obtaining the opsonic index so great as to make the result doubtful? I agree with Dr. Hektoen, and with those who have said to-night that the sources of error, if careful work

is done, can be largely eliminated, so that we can get a fair approximation to a true standard.

When we began this work at the Michael Reese Hospital eight months ago (and there Dr. Greensfelder was the one to organize it), Dr. Grace E. Papot, who did most of the work, and myself worked on a number of cases of tuberculosis. I made a number of counts on cases which were likewise counted by Dr. Papot. Since I never worked on more than one or two cases at the time, I counted two hundred leucocytes in each case, counting every one, poly- and mono-nuclears. Our figures did not agree. However, after I adopted the same system Dr. Papot used, (who worked on five, six or more cases daily) namely, counting the bacilli in 50 polynuclear leucocytes only our figures agreed so well that we sometimes had a difference in our results of 1 or 2 per cent. only. So if the counting is done very accurately according to an invariable system, the results may be said to be quite reliable.

We have treated at our hospital a number of cases, and have largely confined ourselves heretofore to the treatment of tubercular cases, and only recently have we taken up some other infections. We have had among our material mostly cases of tuberculosis, apparently well adapted to this treatment, and we have had some very striking results; but, again, we have had in probably 50 per cent. of the cases results that have been indifferent or bad.

I have here a number of charts which I desire to pass around for exhibition. As one of our star cases, I may mention that of a patient of Dr. Frank Johnson, a physician from Wisconsin, who presented symptoms of what I thought was hyperplastic intestinal or peritoneal tuberculosis. He had a low index when he presented himself; it went up and he increased in weight, his appetite markedly improved, he was a different man inside of six weeks, and his index has remained normal. We have had a few other cases of local discharging tubercular sinuses which have healed and have remained closed up to date. On the other hand, we have had cases of local tuberculosis which have not improved. Another very favorable case was one referred to me by Dr. Darling, a case of tubercular keratitis. Dr. Darling has notified me that the patient was so much improved that he considered her practically cured.

I had another patient referred to me by Dr. Ries. This man had a local hyperplastic tuberculosis of the rectum. The patient, as was later discovered by Dr. Ries, also had pulmonary tuberculosis. During a prolonged treatment of eight or more weeks his local tuberculosis, which had also been operated on, healed, but the pulmonary tuberculosis did not improve. I found tubercle bacilli frequently in the sputum, and even while they often were inside of leucocytes, the general condition of the man was finally such that he had to be sent to Denver.

I have seen the case of a boy who had tuberculosis of the knee joint. This patient was under treatment by Dr. F. Mueller and was also once seen by Dr. Ryerson. Dr. Mueller has notified me recently that there was marked improvement in his condition, but the boy had also been treated orthopedically by Dr. Mueller, who naturally makes the point that unless we have parallel cases, some treated by vaccines, and others by the old methods, and compare the results, we can not be certain that we have accomplished anything remarkable by the opsono-vaccine method.

I have had a chance to treat one case with pneumococcus vaccine, but must confess the case has not been treated properly, because I could not take the index. At the time Dr. Papot was on her vacation, and I did not have the leisure to take the index. The case seemed favorable, however, for vaccine treatment. I had made blood examinations and had established the fact that what clinically appeared to be a chronic rheumatism of some of the joints was due to a chronic pneumococcus infection, with endocarditis. When I first obtained a growth of pneumococci in the cultures, I proposed the vaccine treatment. After three weeks, when the culture had died out, the patient was sent to the hospital, and now wanted the vaccine treatment. I made two blood cultures which were negative,

but after making a third one I succeeded in getting again a growth of pneumococci. I treated the patient for a number of weeks by vaccine injections, being guided by the local reaction, but he did not get better.

In conclusion, I want to corroborate what Dr. Ochsner has said, and what other conservative men have openly said here to-night, namely, that the vaccine treatment, under the guidance of the opsonic index, is not a panacea for all bacterial infections; it is not a panacea for any single one of the bacterial infections. In a certain percentage of such cases of bacterial infections we get good results, hence we are justified in using this treatment and trying to make the best of it, where other methods have failed and whenever there is any hope for results.

Dr. Alice Hamilton:—I wish to speak of the cases of gonorrheal vulvo-vaginitis in little girls which have been treated at the Cook County Hospital in the services of Drs. Abt, Churchill and Baum. We have carried on the work there for the last three months, during which time we have had forty-two cases under observation for periods varying from three weeks to three months. The cases were divided into two groups. In one group of cases we gave the usual local treatment, consisting of douches of potassium permanganate, followed by instillation of argyrol. In the other group we resorted to the vaccine treatment without any local treatment. A comparison of the two groups shows that the advantage is on the side of the vaccine treatment, although the results obtained by it can not be called brilliant. In one group of twelve cases under vaccine treatment the average duration of the discharge was a little less than five weeks. In a group of twelve similar cases in which local treatment was given the average duration of the discharge was a little less than six weeks. In a group of twelve children who had a severe form of the disease the average duration of profuse discharge under vaccine treatment was about fifteen days. In a group of seven children who were given local treatment and who had a severe form of the disease, the duration of profuse discharge averaged four days longer, so that the advantages are slightly in favor of the vaccine treatment.

The chronic cases treated were not so numerous, and it was not possible to control them in the same manner, as no two children could be found who had the same degree and same duration of the disease, and it was necessary to compare the condition before injection with the condition after injection. In three cases in which the duration of the discharge before injection averaged about four and a half months the discharge after injection lasted on an average only sixteen days. Aside from the fact that the advantages are slightly in favor of the vaccine treatment, as far as the duration of the discharge goes, there are other points in its favor. The local treatment of little girls is open to grave objections. For one thing, it has been found that local treatment in the case of little girls has been apt to lead to masturbation. Three chronic cases in the County Hospital, who under local treatment were persistent masturbators, have given up the habit altogther since the vaccine treatment was substituted for the local treatment.

Another thing in favor of the vaccine treatment is this, that it is applicable to all kinds of cases. It can be used in dispensary practice, while local treatment can not be given satisfactorily outside of a hospital.

Dr. T. L. Dagg:—My experience with opsonic work has been in a technical way at the Chicago Laboratory. I have not been following the clinical side of it so much, but I have been struck by the difficulties and sources of error which are constantly coming up in the matter of technic. At present it does not appear to me that we have a very practical working system. When we take into account the difference in value which the strains of a given organism bear, it means a whole lot. For instance, an organism recently isolated from the animal is only slightly, if at all, taken up by the leucocyte, while subsequent strains may be readily acted upon, depending upon the degree of attenuation.

Another factor is the receptivity of the leucocyte. Another thing is in the control. The phagocytic value of your control will vary from day to day. A

control which will give you a phagocytic count of one point to-day may to-morrow, from the same individuals, give you quite a percentage difference. If you use the same individuals to form control, that varying from day to day, it makes it difficult for you to form the opsonic index upon a patient upon whom you are working. The different forms of organisms show different activities toward the opsonic value or toward the phagocytic index, and these factors all combine to make the determination of the opsonic index a rather difficult proposition.

It is to be regretted that we have not a standard. It is hard to get a working standard, so that one group of workers can compare their work with another. Each worker has a standard largely his own, and with these factors always interfering and changing, it does not appear to me to be, at any rate, a scientific method from the standpoint of treatment. In some of the eastern hospitals they have done away with the opsonic determination entirely, and are relying on the clinical symptoms. This is being done in the Johns Hopkins Hospital, where that method is in vogue.

Dr. William J. Butler:—I wish to join Dr. Herzog in paying a high compliment to Dr. Hektoen and his co-workers, and likewise to Dr. McArthur and Dr. Hollister for the admirable work they have done in this field in Chicago. I can assure you that the work of Dr. Hektoen and his associates is more appreciated abroad to-day than it is in Chicago, which they have served to make the leading city in America in the immunity field.

In referring to the papers that have been read this evening, I wish to speak briefly of the diagnosis of tuberculosis. I understood Dr. Lincoln to say that a low index was to be regarded as diagnostic. In my judgment, a low index is not essential to the diagnosis of tuberculosis in opsonic work. It is a variable index that clinches the diagnosis. It is an index to-day, for instance, of 1.0, while to-morrow it may be 1.2 or 1.3, and in a few days it may be 0.6 or 0.8 and so on.

Then, again, in the matter of joint cases, it is here where the index work is valuable, if rightly employed. The mere fact that we get a normal index in joint cases, suspected to be tuberculous, by no means excludes a diagnosis of that condition. Again, the fact that we may get two or three practically normal indices, by no means excludes the diagnosis of tuberculosis. In these cases, if there is no absorption from the focus of infection going on, the index may not vary a particle. If, however, you should employ massage of the joint, or use a Bier's bandage, causing passive congestion, and thus forcing lymph through the focus of infection, it will take up tuberculin from the diseased tissues and, returning to the general circulation, produce an autoinoculation, as will be evidenced by a variable index, that is, one with negative and positive phases. If this measure is employed in the diagnosis of joint lesions you will find the diagnostic value of the opsonic index to increase greatly.

Again, let us take an abscess in a joint or an abscess anywhere that is tubercular, if it increases under tuberculin treatment, guided by the opsonic index, this by no means injures the value of tuberculin as a therapeutic recourse in combating the tubercular process. If an abscess under tension is not being traversed by the lymph or blood serum, that is laden with antibodies resulting from the injection of tuberculin, you will find no local effect. In these cases you must resort to the following procedure: The abscess must be evacuated—at least in part—to release tension and to permit of extravasation of lymph or serum into the focus. In a joint passive congestion, properly regulated, produced by Bier's bandage, may be employed to great advantage, and by so doing you will find the results obtained by tuberculin treatment greatly enhanced. Incidentally, it may be mentioned that this explains the action of induced congestion by Bier's bandage, namely, autoinoculation from the diseased focus; the advantageous or disastrous results depending on a resulting well-regulated or excessive autoinoculation. This likewise explains the good results sometimes obtained by *x*-ray and Finsen light and other agents, determining blood to seat of disease.

In regard to the lessening of connective tissue around tubercular glands, it has been a matter of observation since the beginning of this work that indura-

tions around tubercular glands, thickening of the skin and scar tissue following operations and healing of fistulæ disappear under treatment, and the overlying skin becomes soft and movable over underlying structures.

With reference to the staphylococcus question, I note that there has been a tendency to use autogenous vaccines. This has been found to be unnecessary, as stock vaccines suffice fully for treatment. At present, in Wright's laboratory, I know that stock staphylococcus vaccines are used entirely. No effort is made to secure autogenous vaccines, and the results obtained are excellent.

As to the treatment of gonorrheal vulvo-vaginitis in children, in hospitals, in my experience the antiseptic injection method has not been very successful. It is true, I have seen the discharge cease, if the treatment was stopped for some time, or even when they were under treatment. However, the results from vaginal irrigations in these cases have not been satisfactory. The results from vaccine therapy, so far as I have observed them, have been highly promising. While my experience with it has not been sufficiently broad to draw conclusions, the results obtained are such as to encourage one to further efforts in this direction. The discharge in many cases has been arrested within ten or fifteen days from the time the vaccinations were begun. I and my assistant, Dr. J. P. Long, have under treatment at this time about twelve cases. In five of them we have had complete arrest of the discharge, and in three of these we have had three successive negative smears, taken at varying intervals. In two other cases, that is, the two of the five in which we had negative smears, the smear was negative at one time and positive at another.

In regard to the preparation of gonorrheal vaccine, I notice that there has been considerable difficulty experienced in preparing it. This can be obviated or overcome by using young cultures of say six or eight hours' time, as recommended by Wright. The twenty-four hour and forty-eight hour cultures give so much trouble in preparing the emulsion and vaccine that they are difficult to work with. They require too much shaking to break up clumps. If you work with six or eight hour cultures you will find that you will have no such trouble with clumping.

To revert a moment to the abscess question, I wish to say that abscesses will increase under the treatment if they are not evacuated, for the simple reason that the antibacterial and antitryptic power of the fluid in the abscess disappears by contact with the bacteria, and consequently the tryptic power of the leucocytes, being uninhabited, acts upon the tissue, digesting them, and thus increasing the cavity of the abscess and its contents. If the abscess is evacuated by a hypodermic needle or trocar and its contents allowed to escape, thus releasing pressure on the abscess wall, the extravasation of serum occurs into the cavity. This fresh serum carries with it antibacterial and antitryptic substances by virtue of which the bacteria are combated and the digestive action of the leucocytes arrested.

Dr. L. L. McArthur:—Before the discussion is closed I would like to say that the experiments made in our laboratory have been conducted, first, to establish the value, if any, of this line of treatment and research. But no one of us has thought for a moment of the abandonment of other measures of treatment for this single one. Of course, in the treatment of any disease we should use all the means we have, but for the purpose of scientific research it is not possible to do that, else our results would be in doubt. Therefore, if the understanding has gone out that we assume this position, that this is the only means of treating any form of bacterial infection, it is a mistake. All means should be used.

Dr. Hektoen (closing discussion on his part):—If I understand Dr. McArthur's question, he asks if subcutaneous injection of minute quantities of bacteria is followed by marked production of opsonins and how the latter are produced. Subcutaneous injections of substances that produce antibodies may give larger positive results than intravenous injections, and relatively small quantities may give larger results than large quantities—a point that should be borne in mind in the dosage of dead bacteria. Right here I would emphasize that the dosage used in

bacterial inoculations is still largely a matter of guesswork, and this should be considered thoroughly by those who treat cases. I cannot say how antibodies are produced when bacterial and other substances are injected, but there is some evidence in favor of the fact that they are produced by the cells at the site of the injection. As regards the accuracy of the opsonic index, when determined by competent persons, I may say that I believe we get fairly constant and harmonious results within certain limits. I am aware that this opinion is not held by many excellent men both in England and here. It is well to emphasize again that the method is not a sensitive one, so far as enabling one to recognize differences in opsonin contents is concerned, and it should not be surprising if in the future opsonins are estimated in the same way as we now estimate agglutinins, because dilutions of serum give a far better idea of the actual amount of opsonins present.

I also feel that it is not sufficiently well recognized that the opsonic index at its best determines only one kind of antibody, namely, opsonin. As is well-known, there are several kinds of antibodies formed in response to injections of bacterial substances, and we do not know at present which one of these different antibodies plays the greatest rôle in healing, nor do we know that when the opsonic index in a given case is high or low at a given time that the index for the other antibodies is also correspondingly high or low. In the case of antitoxic substances, for instance, which we may suppose do develop in infections and infectious reactions, their index might be high while the opsonins are low, or vice versa. Those of you who followed the development in regard to agglutinins may remember that when they were first discovered it was believed that they would constitute a real measure of immunity. But that is not now accepted to be the case, and it may well be that such may prove true also as regards the opsonins. Consequently, too much weight should not be placed upon the value of the opsonic index as an indicator of the total anti-infectious power of the body.

Finally, I wish to dwell again on the importance of the method of tuberculin immunization in the treatment of chronic tuberculosis, the dose being increased so carefully that no clinical reactions are produced, and if thought best, associated with estimates of the opsonic index. As it is found that certain cases of chronic tuberculosis fail to respond to the laboratory method of giving tuberculin, as is illustrated by some of the cases mentioned here to-night, then it would seem proper that other methods should be tried; and the tuberculin immunization method may be of greater advantage also in that the immunity to future outbreaks of tuberculosis may be fairly assumed to be made greater. Those who are interested in the treatment of tuberculosis of the lungs should certainly consider the advisability of taking up again the use of tuberculin upon a larger scale, and to such I recommend a careful study of recent papers by Trudeau and others.

Dr. Lincoln (closing the discussion on her part):—Diagnosis on the basis of the opsonic index is, I believe, of more importance in tuberculosis than in other infections because the clinical diagnosis is often obscure. Dr. Butler misunderstood me in saying there was always a low tuberculo-opsonic index in tuberculosis. I intended to say that the average of a series of observations of tuberculo-opsonic indices was low; for, as he stated, at times it may be very high, while at other times it may be low. An index within the normal range does not necessarily mean there is no tubercular infection.

Dr. Vail:—I would like to ask Dr. Butler what media he has found successful in his opsonic work in getting a growth in six hours which was readily usable in the laboratory?

Dr. Butler:—Blood agar, doctor.

Dr. Hagans (closing the discussion):—Speaking of the use of stock vaccines, one reason why autogenous vaccines are preferable is because patients themselves object very much to having the organisms of other people injected into them. They like to have their own vaccines, and they are opposed to stock vaccines for that reason.

CLARK COUNTY.

The Society met in Dr. Bradley's office at Marshall, Ill., at 2:00 p. m., Oct. 24, 1907. The members present were Drs. Bradley, Duncan, Rowland, Burnsides, S. W. Weir, Mitchell, Smith, L. J. Weir. A dozen interesting cases were reported by all members present and many practical points made in diagnosis and treatment.

The speaker of the evening being absent the subject for the meeting, "Infectious Diseases," was taken up and discussed by all present. Among other things it was considered that the milder infectious diseases, measles, whooping cough, etc., were not considered as serious as they are and therefore neglected, that the danger of sputum from a consumptive ought to be known by every one, then a consumptive would destroy his sputum in order to get the approval and benefit of society; that all children ought to be under medical supervision that they may develop into strong, robust men and women so they can resist infection. Proper habits of life (exercise, food, fresh air, etc.) were considered very necessary to increase resistance. All infectious diseases were considered preventable and the scientific prevention is destruction of sputum in consumption, disinfection of feces, urine and all discharges from typhoid fever patients, quarantine in measles, scarlet fever, etc.; that the public should be informed thoroughly upon the prevention of infectious diseases, for about one-half of our race dies of them and their sequelæ: that a doctor should be elected by the physicians of the county and appointed by the state board of health upon a salary who should look after the health of the county, and that the family physician who is the adviser and authority on everything medical should teach his patrons to be afraid of contagious diseases.

New members. The rules of the society were suspended and Dr. R. A. Mitchell was elected to membership by acclamation. Mr. James, a medical student, was present as visitor.

FOX RIVER VALLEY MEDICAL SOCIETY.

The eighty-fifth semi-annual meeting of the Fox River Valley Medical Association was called to order by the President, Dr. A. A. Fitts, at 10:25 a. m., Nov. 12, 1907, at Trinity Parish House, Aurora. The following visiting doctors were introduced and the privileges of the meeting extended to them: H. W. P. Peterson of Dundee, Elizabeth Traut, Annie Braunwerth and A. E. Halstead of Chicago. The Board of Censors having reported favorably on the names of Geo. W. Haan of Aurora, Harriet B. Ward of Elgin, Oscar W. Hubbard, J. C. Augustine and Frederick H. Daniels, all of Batavia, on motion of Dr. Bell they were unanimously elected to membership. On behalf of the Committee on Necrology, Dr. Nason presented a brief biography of Dr. Julia Meiklejohn; Dr. Wm. P. Sherman one of Dr. A. E. Field and President Fitts one of Dr. C. A. Bucher. The chairman of the committee then asked for more time to prepare a report on the death of Dr. L. S. Taylor; this was denied and the secretary instructed to prepare such biography and suitable resolutions of sympathy and spread them on the records of the society and hand copies of the same to the families of the four deceased doctors. Dr. McDonald, of the Committee on Contract Practice, reported that two of the committee had met once and decided that it would be best to wait till other states had settled the question. He then read from the *Michigan State Journal*, the report of a committee appointed by that state society, and also an editorial on the subject from the November number of the ILLINOIS MEDICAL JOURNAL.

Speaking for himself he thought it impossible to put a price on another man's labor, but that the man who did contract work injured himself more than anyone else. On motion of Dr. Cahagan the report was accepted and on motion of Dr. Rutlege (the other member of the committee) the committee was discharged.

The retiring secretary-treasurer then made the following report for the three years he had held office:

Active members in 1904	22
Active members in 1907	65
Associate members in 1904	63
Associate members in 1907	20
Dropped for non-payment of dues	13
Removed from the district	6
Deceased	8

TREASURER.

Total receipts (3 years)		$813.52
Expenses:		
Printing	$ 48.95	
Postage, stationery, etc.	26.41	
Banquets	316.65	
Per capita tax, state	298.00	
Balance on hand	123.51	
	$813.52	$813.52

He then spoke very emphatically on the subject of the want of common courtesy on the part of some members in failing to answer letters addressed them by the secretary and bespoke for his successor more considerate treatment and cooperation, urging them to keep the secretary informed of all cases of serious illness or of deaths or of removals or other changes among the doctors of the district. The report was accepted and on motion of Dr. Bell a vote of thanks was tendered the retiring secretary.

The society then proceeded to the election of officers for the year 1908 with the following results: President, Dr. J. W. MacDonald, Aurora; vice-president, Dr. E. H. Abbott, Elgin; secretary-treasurer, Dr. George F. Allen, Aurora; member of the executive committee, Dr. H. A. Brennecke, Aurora; member of the program committee, Dr. J. W. Dreyer, Aurora; member of the board of censors, Dr. R. G. Scott, Geneva; delegate to the state society, Dr. W. C. Bridge, Elgin, alternate, Dr. J. W. MacDonald.

The scientific program then followed: "Histology and Pathology of Ulcer of the Stomach," Dr. Thos. E. Macauley, Elgin; "Histology and Pathology of Ulcer of the Duodenum," Dr. Rozel M. Curtiss, Marengo; "Medical Treatment of Ulcer of the Stomach and Duodenum," Dr. Samuel R. Ward, Richmond; "Surgical Treatment of Ulcer of the Stomach and Duodenum," Dr. E. A. Halstead, Chicago.

Dr. Curtiss illustrated his paper with numerous microscopic slides, and Dr. Halstead his by doing a gastroenterostomy on some viscera. The retiring President, Dr. Fitts, then read a paper on the "Unreliability and Dangers of Paraffin Injections for Hernia." The meeting closed with a banquet participated in by several of the doctor's wives and by no means the least enjoyable part of the occasion.

MEDICAL TREATMENT OF ULCER OF THE STOMACH AND DUODENUM.

S. R. Ward, M.D., Richmond, Ill.

It is well to bear in mind that it is an ulcer that we are called upon to treat, similar in its nature to the simple round ulcer found elsewhere in the body. It may be superficial. It may be deep. Differing from simple ulcer elsewhere, so far as treatment is concerned, only on account of its location and the conditions and influences accompanying that location. Rest is the first important step in the treatment of ulcer. A gastric ulcer in its obscurity is subjected to certain antagonistic influences peculiar to itself, irritating food, gastric peristalsis, excess of hydrochloric acid, an impoverished condition of the blood, as well as to irritation produced by exertions of the body in exercise or labor as ulcers elsewhere so frequently are. The diagnosis of peptic ulcer is still one of the difficulties of medical practice. The chronic ulcer with its long history of dyspepsia and emaciation with epigastric pain of a gnawing, boring character extending to the back, also localized, circumscribed tenderness below and a little to the left of the ensiform cartilage, or in the back at points a little to the left of the 9th or 10th, perhaps 12th rib, or those instances of short duration with hematemesis, especially if accompanied with epigastric pain, suggest themselves at once as possible cases of gastric ulcer. But how many cases have existed, run their course for

a season and healed without the patients or their medical advisers ever having realized that they had to do with a gastric ulcer. Then we know that many cases have as their first and for some time their only abnormal sensation, an uncomfortable feeling of gastric fulness and distention after meals, to be succeeded afterward as the ulcer develops by pain after eating. In other instances there may, in the small superficial ulceration, be no noticeable or other symptoms to call our attention to ulcer until a profuse hemorrhage with hematemesis appears, the result of a small erosion opening a blood vessel in the gastric mucosa. Then other cases of perhaps a fairly well-preserved patient complaining after eating, of pain and vomiting with perhaps hyperacidity, perhaps not.

Ewald states hyperacidity was present in 34.1 per cent. of his cases. Thus we might go on narrating many instances of cases where the indications pointing to the presence of ulceration are few and indefinite.

I am led to refer to these because we have learned in later years especially, how important it is to treat gastric ulcer at its earliest stage, if possible. The earlier we treat it the better our results. I think we would all agree that taken in its earliest stage and the patient put upon the simple treatment of absolute rest in bed and even to the carrying out of the proper steps necessary to be taken in the matter of rectal and stomach feeding with peptonized liquid food for two or three weeks, as I shall take occasion to mention later on, that we would accomplish a cure in nearly every instance. The only exception occurring to me being syphilitic or tuberculous ulcers found in their early stages. The former of which would of course require in addition, specific treatment and the latter a constitutional treatment for a longer period of time. Unfortunately, however, for ourselves and our patients, there are opposing influences that too often deter us from this course. Our uncertainty as to the correct significance of the few symptoms presenting themselves to us, the unwillingness of our patient to believe that his condition can possibly be so serious as to necessitate taking to the bed and undergoing such a method of treatment; perhaps his business engagements are such, or the needs of his family, that he does not see how he can spare the time or bear the expense required by such treatment unless he should feel much worse than he does at present. Then there arises in our own minds the possibility of the presence, instead, of such condition as gastralgia and nervous dyspepsia, and we are not so strenuous as we should be and conclude we will see what we can do for our patient and not send him to bed. The treatment so far as we can accomplish it without absolute rest would be first a modified diet excluding all coarse and indigestible foods that would by their presence irritate any possible erosion of the gastric mucosa. If easily digestible forms of solid food can be taken, or semi-solid, without exciting pain or other symptoms of irritation, they could be continued and nitrate of silver ¼ gr. and extract of belladonna ⅛ gr. in pill form three times a day, or nitrate of silver alone in solution of 0.2 to 300 c.c. of water, a tablespoonful every two hours, may be administered. Large doses of bismuth subnitrate in perhaps four ounces of water taken upon an empty stomach in the morning and late in the evening. Doses of 15 to 60 grs. may be given three times a day. Pain has rapidly disappeared under this treatment, and granulation of the base of the ulcer taken place and complete healing followed. For the hyperacidity present in many cases an alkaline treatment is naturally suggested. Belladonna is supposed to be helpful in correcting hyperacidity, still the main reliance is placed upon magnesia and carbonate of soda and potash, to which may be added a carminative or rhubarb and sugar of milk. Some mild form of laxative is essential, as it is important to keep the bowels in a mildly active state. This is useful in all cases and especially in large numbers where from anemia and impoverishment of blood there is constipation. The artificial Carlsbad salt is recommended. Different mineral waters have been helpful. Some mild form of chalybeates with arsenic is often beneficial in these cases, beneficial too in amenorrhea, which is sometimes attendant upon this disease.

Conheim and others have spoken very highly of the use of oil, either linseed or olive oil, given in gradually increasing doses as from a tablespoonful to a wine-

glassful, or introduced into the stomach in large quantities through the stomach tube. Their patients all bore the remedy well, and were relieved of the pain, the spasm and catarrh. Cases that had been set apart for an operation had been cured. After the administration of the oil, the patients were placed in position so that the ulcer was at the most dependent point, as if ulcer of the pylorus, the patient was placed on the right side. Ewald did not meet with such good results. On the contrary some of his patients found the oil so repugnant that they could not endure it, and in one case the retching and vomiting resulting produced severe gastric hemorrhage.

In the more serious classes of cases there can be but one method of procedure. Rectal feeding exclusively for five or six days, consisting of peptonized milk four or five ounces three times a day, the bowels having been cleared an hour before with warm sterilized normal salt solution. Nourishment may afterwards be administered *per orem*. The food to be neither too hot or too cold, warm and taken slowly, in small quantities and at short intervals. Milk peptonized is undoubtedly one of the best forms of nourishment. It may be given two or three ounces every two hours or smaller quantities every hour according to the condition of the patient. While cows' milk holds the first place in the diet list in gastric ulcer, there are not a few individuals who can not take milk without being made sick by it. To those, other forms of liquid nourishment must be given, barley water, Horlick's food, beef peptonoids, gruel made of arrow-root, farina, or oatmeal; these changes also become necessary to those who can take milk.

As symptoms improve, arrest of hemorrhage, relief of pain, an evident improvement in the digestive condition of the stomach, there can be added raw egg in milk or the white of egg well beaten, broths, bouillon, softened crackers, and still later scraped meat. Einhorn has mapped out a table of diet which he has found very generally applicable, his table covering a period of twenty-four days. There is generally sufficient relief of pain so that the external applications may be removed at the end of the second week. And frequently the patients begin to sit up at the beginning of the third week, a half hour the first day and upon each succeeding day little longer sittings as may be indicated by the progress the patient is making in comfort and strength. Should they seem to experience any return of pain the lighter diet with even the return to rectal feeding should be resorted to if necessary. This method of treatment in the majority of cases has proved curable, and in very many cases within the space of three or four weeks. In profuse gastric hemorrhage there must of course be instituted radical measures to control the bleeding. In addition to confinement to bed there should be applied the ice-bag over the stomach. There may be given hypodermic injections or 2 gr. doses of ergotin. Should unpleasant symptoms arise a ⅛ or ¼ gr. of morphin may be added to the ergot. Ten drop doses of adrenalin solution in water three or four times a day may be given. The internal administration of gelatin, one teaspoonful of a 10 per cent. solution. In repeated hemorrhages, Ewald recommends very strongly the injection of ice-water by the stomach tube into the stomach in quantities to empty the stomach of its contents, which he declares are sometimes surprisingly large, and leaving sufficient quantity to act as a check to the bleeding vessel or vessels. The introduction of the tube is preceded by the application of cocain to the pharynx and if necessary the hypodermic administration of morphin. After an extended experience he expresses himself as having been surprised to see how rapidly the hemorrhage ceased. Another measure is the application of a ligature about an arm or arm and leg. Although some cases of hemorrhage prove fatal they are comparatively few. By far the great majority of cases recover.

In collapse subcutaneous injections of ether 15 to 30 minims in the same quantity of sterilized water or of camphor 1 to 2 gr., dissolved in 15 minims of sterilized olive oil may be administered every three or four hours. Stimulants may be given. Hot applications to the feet. Hypodermic injections of strychnia or digitalis are useful. One or two pints of sterilized normal salt solution per rectum or by hypodermoclysis are also helpful.

For perforation, absolute rest, ice-bag, opium suppositories, the absolute exclusion of food from the stomach, are the well-nigh hopeless measures resorted to medicinally.

It is well to remind patients that for several months after recovery they should exercise care in their diet, not permitting themselves to indulge too heartily in eating and to avoid over-taxing their strength. In those cases where menstruation is not interfered with, the patient should be directed to remain in bed during the menstrual period for several months. So much we may do in the way of medical treatment for peptic ulcer.

About 60 per cent. of all cases, it is estimated, are cured by medical treatment. In the treatment of gastric ulcer we have described practically the treatment of duodenal ulcer. There is never present hyperchlorhydria and therefore no necessity for its treatment. Hare says that the treatment of ulcer of the duodenum is absolute rest in bed, aside from these measures it is purely surgical. And when we think how problematical the action of medicine is upon the duodenum, we are strongly of the same opinion and especially since the surgical result is simply to put the duodenal ulcer at rest.

UNRELIABILITY AND DANGERS OF PARRAFIN INJECTION FOR HERNIA.

A. A. Fitts, M.D., Aurora.

I do not know who first thought of injecting for hernia. I am sure it is nearly as old as the invention of the hollow needle. Decoctions made from the astringent barks have been used, iodin, wine and carbolic acid have been used, with the hope that the inflammatory products would close the ring. The layman has been and will continue to be the prey of the charlatan and quack as long as he has such dread and fear of the knife.

I have had one case for operation since the method of injecting paraffin began (7 years ago) that seemed to teach the unreliability and danger following each injection.

American, age 62. Complete inguinal hernia of left side, reduceable and perfectly retained by truss—of seven years standing. January 1, he was injected by some man, who claimed to be connected with the Medical Institute of Chicago. I have no knowledge of the place. After the injection a truss was applied over point of injection and worn three days. There was great pain and swelling, judged by what patient and his family said. On removal of truss the hernia passed to one side of the point of injection and was worse than before treatment.

About the tenth of January he saw the institute man again; he had two more injections made, and again applied the truss. This time he came home and was confined to the house for several days. On removing truss the gut came down, and owing to the swelling could not hold it back with truss. He was like the Irishman who was climbing trees to catch crows; when asked what he was up to, said, he was going to catch one of the black devils. Oh, you can not catch one of them in a thousand years. Well, then I'll be after bothering them. So with the patient; he thought he would bother the institute man again and get his money's worth. He went to the institute and received four shots, came home and was confined to his bed.

February 3, he sent for me and gave me the history of what he had been doing, but did not know what had been injected. I found the temperature 104°, a rapid pulse, tongue coated and patient complained of pain in left groin. On examination found in left inguinal space a swelling of a hard nodular mass, extending from Poupart's ligament to external ring, about two inches wide. One inch above Poupart's ligament I found a small fluctuating point over one of the nodules; owing to inflamed condition of parts, decided not to make a complete operation until the condition of patient was improved. I opened a small abscess and cleaned it out, also ordered him a full dose of castor oil, and a thorough flushing of bowel, after action of the oil. On my next visit found temperature normal and swelling very much reduced and was able to make out several hard

lumps each side of the cord. I advised an operation to clean out the injected paraffin and close the canal. Patient and friends consented, so had a room prepared at his home and February 6, assisted by Dr. Scott, we began operation over lower nodule, did not make a continuous incision the length of the canal for fear of local infection about some of the nodules. We found inflammatory products of small abscess, which we removed in mass and continued the incision as near a straight line as possible from one nodule to the other until the ring was reached. We removed seven blocks of paraffin as you now see them. I found the tissues were filled with small flakes of paraffin, and in passing needle through them gave a feeling of frozen tissue. The sack was well down in canal and adherent; loosened it up full length, opened it and returned the bowel to the abdomen, looped sack with catgut, stitched and anchored it above ring by stitching through wall of the abdomen, used chromicised gut for deep work and silk-worm gut for skin. Closed all but lower end of canal, which was packed with wick of iodoform gauze. The wound healed nicely, but on seventh day a small abscess formed, at least one inch from line of scar. I opened this up, finding paraffin. After this the patient made a perfect recovery and there has been no indication of recurrence of hernia.

The lesson learned from this case is, there is more danger in the method by each injection, than there is from a radical operation and the patient has about the same chance of a cure as the irishman had of catching the crows. Some of the dangers are, gangrene of the skin over point of injection, from pressure of paraffin, neuralgia of cord, atrophy of testicle. I believe the profession is somewhat at fault for this class of work. The people are not aware of the small risk of an operation. If there had been one-half said about operating for hernia as has been said about appendicitis, they would be just as willing to be operated, and I believe there are more cases of hernia that require an operation than there are of appendicitis. Every case of hernia over ten years of age and under seventy should be operated, if physically able. I am not so sure of appendiceal cases, for I have seen a number of appendices removed when it would require the examiner to make new pathology to find anything wrong with the organ. I believe that if hernia was as painful as ordinary bellyache there would not be many of them going for methods outside of a good surgical treatment. As there is no pain or other alarming symptoms as a rule, they are allowed to drift along from childhood to old age without treatment.

HISTOLOGY AND PATHOLOGY OF GASTRIC ULCER.

THOS. E. MACAULEY, M.D. ELGIN, ILL.

Owing to the time limit for this paper, and the greater importance of those to follow, I have taken the liberty to omit the histology and the finer pathological findings, and of the substituting a few theories on the etiology.

Gastric, peptic, round, or perforating ulcer, is more frequently single, but may be multiple. Situated more often about the lesser curvature, towards the pylorus, and posterior wall. The ulcer may be non-indurated and involve only the mucous membrane, or markedly indurated and involving all the coats of the stomach. The indurated ulcer can be felt and diagnosed from the exterior of the stomach, at operation or postmortem. In size the ulcer varies from a few mm. to 3 to 5 cm. Shape may be round or oval, horse-shoe, or saddle shaped. The horse-shoe or saddle shaped variety being most often found almost surrounding the pyloric end of the stomach. In depth the ulcer presents most often a funnel shape, with the apex towards the muscular coat. The walls often present a terraced appearance, due to the involvement of the different layers, as the ulcer passes through. The tissues in the immediate vicinity are often markedly indurated, showing the efforts of Nature to restrict the advance of the ulcer.

The general condition of the mucous membrane of the stomach may in some cases, be found perfectly normal, in others there may be polypoid vegetations, and hemorrhagic erosions throughout. The ulcer as it deepens may involve im-

portant blood vessels and nerves, and finally cause a perforation of the stomach walls.

Hemorrhage may be a more or less constant oozing, or sudden, severe and fatal. And why may not the chlorotic and anemic patient be such in many cases because of this constant oozing, not discoverable except by chemical analysis of the stomach contents or bowel movements?

Males die after thirty years of age more frequently from hemorrhage, females before thirty, from perforation. Perforation according to Osler occurs in about 6½ per cent. of all cases, and is said to be less common than hemorrhage, and yet this percentage must be modified by the fact that owing to inflammatory adhesions to adjacent organs, perforation except of the anterior wall may not be recognized, except during surgical intervention or postmortem. Perforation of the posterior wall will be most often walled off from the peritoneal cavity by adhesions to the liver, spleen, pancreas, diaphragm or intestines, and thus the patient escapes some of the dangers of peritonitis, but is still exposed to the dangers of suppuration and ulceration of the organs involved. Perforation of the anterior wall leads almost invariably to a general suppurative peritonitis, owing to the less likelihood of protective adhesions.

Another more or less serious condition incident to gastric ulcer, is the cicatricial contraction, producing as it does a more or less complete change in the size and shape of the stomach, and this with the adhesions that may be made to adjacent organs, interfering greatly with its motor and digestive functions. We find stenosis of the pylorus, hour-glass contraction and dilatation. Cicatricial contraction and a healed ulcer do not necessarily go hand in hand; you may find a stomach all deformed from cicatricial contraction and at the same time find a large and unhealed ulcer. Aside from the interference with motor and digestive functions, the pressure of the cicatrix on important nerves may be a cause of pain. Not infrequently malignancy develops in the seat of the gastric ulcer. What causes an ulcer of the stomach is a question not answered to the satisfaction of all. But Virchow's theory, advanced in 1856, that circulatory disturbance in the larger branches of the vessels which supply the stomach wall represented the starting point, still seems to be the most valid. There is an embolus, thrombus, or some interference with the circulation sufficient to lower the resistance of the tissues to the action of the acid gastric juice, which creates a solution of continuity in the form of an ulcer. It has been noted that in certain countries where the main food of the community consists of a large percentage of potash, chronic gastric ulcer is rare. Hyperacidity may account for the continuance of an ulcer, but hardly as an initial cause. Traumatism may be an exciting cause, such as certain occupations and tight lacing. Blood depravity may be a cause.

Futterer, in an experiment with rabbits, excised a portion of the mucous membrane of the stomach, and then caused a marked anemia by blood destroying chemical substances, succeeded in producing an ulcer identical with the human ulcer, and they located by choice in the same portion of the stomach, and their continuance was, in part or wholly, dependent on the continuation of the general anemia. So if anemia was so necessary for the continuation of the ulcer, he emphasized the necessity of curing the anemia.

Fenton B. Turck, in an article in the *British Medical Journal*, April, 1907, said that there seems to be some toxic condition produced which overcomes the natural resistance, resulting in cytolysis and possibly some chemical substance formed within the alimentary tract which, when absorbed, may neutralize the protective bodies in the blood and tissues, resulting in auto-cytolysis. He succeeded in producing ulcers in the stomachs of dogs by feeding them the colon bacillus for a variable time. The ulcers showed no tendency to heal, but if the feeding were stopped and the dogs kept on good food, amid hygienic surroundings, and killed after a month or two, the ulcers were found in various stages of healing. Healing proceeded by round cell infiltration and formation of bands of connective tissue. Following the operation of gastroenterostomy there was a marked lessening of the total acidity of the gastric contents, amounting to 30 or 35 per

cent., and usually a healing of the ulcer. And it seems reasonable to suppose that the lessened acidity is a large factor in the healing, for where the secretion of hydrochloric acid is held in check entirely, there is a prompt healing of the ulcer. Gastric ulcer is rare in the very young, but from 15 to 25 years it is common in the female; after that period it is about equal in the sexes. It may occur in old people, giving a history dating back five to twenty-five years. Heredity seems to have no influence. Arteriosclerosis is well marked in quite a large percentage of cases. In cirrhosis of the liver it is comparatively common and is more subject to hemorrhage owing to the impeded circulation in the liver. It is thought by some that the reason the ulcer develops by choice about the lesser curvature and towards the pylorus, is that because this part of the stomach is not subjected to the same amount of contraction as that towards the greater curvature. When the walls contract over a lesion it is more likely to heal than when it is left open and exposed to the action of the gastric juice. Frequency of ulcer of the stomach varies in different localities and countries from 1½ to 4 per cent. or better of all postmortems.

GREENE COUNTY.

The annual meeting of the Greene County Medical Society was held in the parlors of the Hotel Roodhouse, at Roodhouse, Friday, Dec. 13, 1907. The meeting was called to order at 11:30 a. m. by President Chapman. The following were present: Carl E. Black, of Jacksonville; W. F. Waggoner, E. S. Gooch, Howard Burns, Carrollton; F. H. Russell, of Eldred; E. H. Higbee, L. O. Hamilton, H. W. Smith, of Roodhouse; H. W. Hand, H. W. Chapman, E. K. Shirley, W. C. Day, F. N. McLaren, G. W. Burns, H. A. Chapin, of White Hall.

Communications from Dr. L. Taylor, chairman of the state committee on medical legislation; A. T. McCormick, Bowling Green, regarding the use of nostrums by physicians; J. A. Egan, secretary of the State Board of Health, regarding medical legislation; Geo. E. Baxter, assistant editor of the ILLINOIS MEDICAL JOURNAL, asking co-operation of the members in securing advertisements for the JOURNAL, were read and ordered filed.

The Board of Censors reported favorably upon the applications of E. W. Fenity and E. G. Proctor, of Kane; J. A. Cravens, of Greenfield; W. C. Day and F. N. McLaren, of White Hall. On motion of Dr. Higbee, the secretary was instructed to cast the ballot for the above named, and they were declared duly elected to membership.

On motion of Dr. H. W. Hand, the following resolution was adopted:

WHEREAS, There are now pending in the Senate and House of Representatives, certain bills, which we believe would be detrimental not only to the profession of the state, but to the welfare of the public, which we believe should be defeated; therefore, be it

Resolved, That the Greene County Medical Society request their Representatives in the General Assembly to vote against the passage of Senate Bill No. 581 and House Bill No. 914.

The election of officers resulted as follows: Dr. E. H. Higbee, of Roodhouse, president; Dr. H. W. Hand, of White Hall, first vice-president; Dr. Howard Burns, of Carrollton, second vice-president; Dr. H. A. Chapin, of White Hall, secretary and treasurer; Drs. E. S. Gooch, H. W. Smith and E. K. Shirley, censors; Dr. Howard Burns, of Carrollton, member of the committee on medical legislation. Meeting adjourned at 12:30 for dinner.

Called to order again at 1:30. The Board of Censors reported White Hall as next place of meeting, Friday, March 13, 1908, with the following program: Address by the president, The Status of Medicine; papers by Drs. F. N. McLaren, L. O. Hamilton and E. K. Shirley.

The following resolutions were presented by Dr. E. S. Gooch, and were unanimously adopted:

WHEREAS, It is detrimental to the best interest of the sick and suffering for physicians to prescribe proprietary remedies and nostrums of which they cannot be assured of the composition, and which are sold by druggists indiscriminately to the public; therefore, be it

Resolved, That it is the sense of the Greene County Medical Society that none of its members should prescribe remedies which are not manufactured in conformity with the U. S. Pharmacopeia or the National Formulary, or have not been approved by the Council of Pharmacy and Chemistry of the American Medical Association, and be it further

Resolved, That the secretary be instructed to send a copy of this resolution to each member of the Greene County Medical Society, the editor of the ILLINOIS MEDICAL JOURNAL, and the editor of the *Journal of the American Medical Association.*

Dr. Smith of Roodhouse then read a very interesting report of cases of pneumonia treated by large doses of quinin, which called forth considerable discussion by all the members present.

Dr. Carl E. Black then gave a talk on matters of great interest to the physicians of the county, and urged the physicians to keep accurate records of every case, which would be of inestimable value in the years to come, showing wherein statistics gathered by the general practitioner in this way would be of more value than those gathered from hospital practice. He also recommended the post-graduate course as outlined by the American Medical Association.

H. A. CHAPIN, Secretary.

MORGAN COUNTY.

Annual Meeting of the Morgan County Medical Society.

The society held its annual meeting at the Library, December 12, 1907, at 8 p. m. President E. L. Crouch in Chair. Twenty-three members present. Dr. G. R. Bradley was elected to membership in the society. The applications of Drs. Adam Wenger of Concord, Lucian Smith of Chapin, Paul Allyn of Waverly, A. E. Obermeyer of Arcadia and D. N. Harris of Prentice were favorably passed upon by the board of censors and laid over under the rules, until next meeting.

Report of secretary, Dr. A. M. King; report of treasurer, Dr. E. F. Baker; report of librarian, Dr. C. E. Black; report of public health and legislation committee. Drs. Black and Norbury: report of tuberculosis committee, Drs. Hairgrove, King and Hardesty, received and accepted by society.

The following officers were elected for 1908: President, Dr. D. W. Reid; vice-president, Dr. Chas. Cole; secretary, Dr. P. E. Hofmann; treasurer, Dr. E. F. Baker; librarian, Dr. C. E. Black; delegate to state society. Dr. T. J. Pitner; alternate to state society, Dr. E. L. Crouch; member of board of censors for three years, Dr. E. L. Crouch.

As some of the members were in arrears in medical defense and therefore not in good standing in the society, a discussion arose as to whether or not the society approved of the medical defense scheme. On a motion, that the society did not approve of medical defense, a vote was put, which resulted in a defeat of the motion. A second motion was then introduced and passed, that the treasurer be instructed to return to members who have paid only part dues, said part paid, with the statement that the society will only accept dues paid in full. The secretary's bill of twenty-four dollars for one year ending December, 1907, was presented and ordered paid. The papers which were to have been read were postponed until the January meeting.

ALLEN M. KING, Secretary.

PEORIA CITY MEDICAL SOCIETY.

The Peoria City Medical Society met October 15. Dr. C. U. Collins presented a paper on Abdominal Incisions. After first giving the anatomical landmarks with special reference to the intercostal nerves, he considered the incision in the different quadrants of the abdomen, explaining the special benefits derived and difficulties of those usually used. He liked the Pffollenburg operation for midline incision, to explore the pelvis. On Nov. 5, 1907, Dr. Kreider of Springfield addressed the society on Congenital Fistula in Sacro Anal Region. On Nov. 19, 1907, Dr. J. W. Pettit addressed a combined open meeting of the Peoria City

Medical Society and the Society for Prevention of Tuberculosis. Dr. Pettit considered the etiology and treatment and prophylaxis especially. He handled his topic so as to meet the needs of the laity. After calling special attention to the needs of a general campaign of education, the meeting was closed by a general discussion by various members present.

STEPHENSON COUNTY.

The fourth quarterly meeting of the Stephenson County Medical Society was held at the court house in Freeport on Thursday, October 31, with the President, Dr. K. F. Snyder in the Chair. The following answered to roll call: Drs. Arnold, Best, E. H. Burns, Clark, Hutchins, L. K. Karcher, Kaber, Mease, Morrison, Moore, Rideout, Rosensteil, Stealy, Snyder, Thompson and Torey. The presentation of clinical cases was a feature of the meeting.

Dr. E. H. Best showed a case of marked ataxia in a boy of 12 years of age. There was beside the inco-ordinate muscular action an increase of patellar and other reflexes, ankle clonus, flabbiness of muscles, drawling speech, drooling at the mouth and general mental hebetude. Ocular examination negative.

L. B. A. Arnold presented a case of carcinoma affecting the inferior maxilla which showed a large sloughed out area with edges greatly undermined. The initial part affected was the lower lip. This was excised on March 2, 1907. On July 6, a growth appeared over inferior maxilla in about the location of the first molar tooth. Incision healed kindly but in two months time a large mass appeared over the jaw which rapidly broke down. Patient now presents a sloughed out area over inferior maxilla six inches square. Glands are markedly affected and patient is quite cachectic. A number of stained sections of the growth were shown.

Dr. K. F. Snyder presented his case of Cretinism which he brought before the society at the July meeting. Since that time the boy has shown marked improvement under thyroid medication. He has received as much as 20 gr. t.i.d. Before reaching this dosage he on one or two occasions gave evidence of over dosage, manifesting all the symptoms of hyperthyroidism. The patient, a boy of 12, resembles one of 6 years of age in so far as his physical development is concerned and mentally is very deficient. Since treatment was begun he has gained 11 pounds in weight and 2 inches in height.

Dr. E. H. Best read a paper on, "Ataxia in Childhood" dilating particularly on the conditions found in Friedreich's disease. Dr. B. A. Arnold gave a paper on "Carcinoma of the Face," and Dr. J. H. Stealy gave an exhaustive paper on "Appendicitis and Peritoneal Adhesions."

UNION COUNTY.

The meeting of the Union County Medical Society was called to order by Dr. S. C. Martin, chairman pro tem. Seven members were present. Dr. James I. Hale read a paper on "Some Hints to Obstetricians." which was discussed by all present. The following officers were elected for the ensuing year: Dr. D. W. Grear, Jonesboro, president; Dr. W. E. Lingle, Cobden, vice-president; E. V. Hale, secretary-treasurer.

WILL COUNTY.

The Will County Medical Society entertained the state society president, Dr. W. L. Baum, Dr. Emil Ries, and Dr. Alfred C. Croftan, of Chicago, at its annual dinner, November 12, given at the Commercial Club, in Joliet. Fifty doctors were present, including a delegation from Morris and other Grundy County towns, headed by Dr. H. M. Ferguson, the Grundy County secretary. They came up to help entertain these three favorites of theirs.

After dinner, Dr. Ries spoke on the subject of cancer. As Dr. Ries had been a student of this subject for two decades he is authority on all that is known and

all that is not known on cancer, and the unknown he says is greater than the known.

Dr. Croftan, in his usual delightful and helpful style, spoke on "The Newer Things in the Treatment of Bright's Disease."

Dr. Baum, in his speech, eulogized Illinois physicians and anticipated the time when organization will make this state society the best in existence. He spoke on "The diagnosis and Treatment of Diptheria."

This Society has completed one month's work of the postgraduate course. We began with the work on "Disease of Blood and Ductless Glands"—the sixth month's work—because it fitted into the work we had been doing. Dr. Cushing led the first meeting and the small attendance might have been discouraging, if we had not had so profitable a meeting, that it seemed worth while to continue. In fact those present were anxious to go on. The meetings have grown in attendance and interest ever since and over half the Joliet members attend. The out of town members have not yet concluded that it is practicable to attend weekly meetings.

One meeting was held without a leader but the members were so generally prepared that it was as profitable as the rest. One bright young physician said he has put 100 hours on the month's work. The interest manifested augurs well for the intelligence of the future members of the medical profession if the plans of a continuous course of study are carried out.

It was thought best to have a practical laboratory man discuss "The Value and Limitations of Blood Examinations," and so Dr. Ralph W. Webster, of Chicago, kindly came down for that topic. His paper was exceedingly valuable and we commend it to societies who will study this subject later in the year.

Annual Meeting, Dec. 10, 1907.

The annual meeting of the Will County Medical Society was held Dec. 10 1907, The society continued the postgraduate study commencing the work on tumors. Dr. A. J. Lennon was leader. Dr. Marion K. Bowles gave a talk on "The Therapeutics of Iron." Dr. Ella Clevedon and Dr. Robert B. Stephenson were elected to membership. The following officers were elected: President, Dr. N. W. Cushing; vice-president, Dr. W. O. McBride; secretary-treasurer, Dr. Marion K. Bowles; delegate, Dr. Watson H. Curtis; member of the medicolegal committee, Dr. Ray B. Leach; member of the state legislation committee, Dr. Marion K. Bowles.

NEWS OF THE STATE.

PERSONAL.

Matt Hill., M.D., was injured by a fractious horse recently in Taylorville.

Dr. Nelson K. McCormick, physician at the Soldiers' Orphan Home, Normal, has resigned.

Robert D. Bradley, M.D., Peoria, Ill., has resigned as president of the Pension Board and will move to California.

Thomas Lanigan, M.D., of Lincoln, has been appointed county physician of Logan County at a salary of $500 a year.

August Arp, M.D., Moline, who fractured his leg three weeks ago, is reported to be progressing favorably toward recovery.

Dr. Rosalie M. Ladova, Chicago, has recovered from injuries received at Winona Lake, Ind., in July last, and has resumed practice.

William D. Humphery, M.D., Virginia, has been appointed physician of Virginia, Princeton and Monroe precincts at a salary of $250.00 per year.

Samuel C. Plummer, M.D., Chicago, Chief Surgeon of the Rock Island System, was presented with a diamond scarf pin by the surgeons of the road.

Henry B. Carriel, M.D., superintendent of the Illinois Central Hospital for the Insane, Jacksonville, was operated on for appendicitis December 3.

Dr. Darwin Kirby, who has been practicing for the last six years with his father, Dr. W. H. Kirby, at Chestnut, Ill., has gone to Chicago to begin his service of eighteen months as interne in the Cook County Hospital.

Dr. C. R. Spicer, of Springfield, has been elected Medical Director of the Yeoman of America, a fraternal insurance order, and will remove to Aurora, the seat of the head officers of that order, and assume the duties of his post.

NEWS ITEMS.

The Cribside Society of Chicago will build a hospital at 481 Orchard street to cost $30,000.

A benefit performance for the Chicago Emergency Hospital was given at the Illinois Theater December 5.

The Peoria Medical Library Association has been incorporated by Drs. Edgar E. Gelder, J. P. Duane and Elliott C. Du Mars.

Dr. Frank W. Wood, of Carlinville, has prepared himself to make autogenous vaccines and treat suitable cases with bacterial emulsions.

A special examination for internes for the Chicago Lying-in Hospital was held December 26 at 302 Maxwell street. The service will begin Jan. 1, 1908.

Professor E. B. Trener, of Pontiac, a "Rubber," was prosecuted in the Circuit Court of Livingston County at its last session and was fined $200.00 for practicing medicine without a license.

Mrs. Johnson White, Chicago, who conducts a so-called maternity hospital on the South Side, is said to have pleaded guilty to practicing medicine without a state license and to have been fined $200 and costs.

By the will of the late Col. Stephen L. Littler, the bulk of his estate is eventually to become available for the foundation and maintenance of a new hospital in Springfield. The estate is valued at nearly $1,000,000.

The annual meeting and banquet of the Alumni Association of Cook County Hospital Internes was held November 26. Dr. Samuel C. Plummer was elected president, and Dr. Frederick A. Besley secretary and treasurer.

After suffering from diphtheria for a week, being treated by Eddyists, a woman of LaGrange died November 28. The disease was not recognized as diphtheria until a few hours before death, when a physician was called.

The Chicago Postoffice Department has issued fraud orders against two Chicago medical institutions located at 152 Lake street and Lasalle street and known as the Boston Medical Institution and the Belleville Medical Institution.

James Lindgren, physical director and fencing master for the new Illinois Athletic Club, Chicago, charged with practicing medicine without a state license, is reported to have been found guilty, December 12, and fined $100 and costs.

"Beverly Farm Home and School for Nervous and Backward Children," at Godfrey, Ill., Dr. W. H. C. Smith, superintendent, has recently completed a new and adequate water supply for all purposes and also added a Nelson septic sewer basin to the equipment.

Alleging that he had lost his right eye because of the lack of attention on the part of Dr. George Starkey, John Craft, a laboring man of Waynesville, recently brought suit in the Circuit Court at Clinton for $5,000.00. After hearing the evidence of the plaintiff, the jury was instructed to find the issues for the defendant.

Mrs. Lucy Hagenow, of Chicago, nearly 60 years of age, was found guilty, November 30, of an illegal operation, causing the death of Mrs. Anna Horavich, and sentenced to imprisonment for twenty years in the state penitentiary. Her conviction is due to the activity of the Committee on Criminal Abortion of the Chicago Medical Society.

The trustees of the Chicago Policlinic have announced that the Henrotin Memorial Hospital is now open for the reception of patients. The building, constructed of reinforced concrete and absolutely fire-

proof, is provided with all the sanitary features essential to a modern high grade hospital. It contains private rooms only, sixty-five in number, most of them with private bath attached.

The sixty-fifth convocation of the University of Chicago was held in the Leon Mandel Assembly Hall, Fifty-seventh street and Lexington avenue, Tuesday afternoon, Dec. 17, 1907, at 3 o'clock. The address was delivered by William Henry Welch, M.D., LL.B., professor of pathology in John Hopkins University and president of the American Association for the Advancement of Science. Subject: "Medicine and the University."

The Springfield Graduate Nurses' Association was organized at the home of Mrs. Edgar Clark, North Grand avenue. Miss Nellie Stevenson, a graduate nurse of Chicago Hospital, was hostess, and an election of officers was held, which resulted as follows: President, Miss Nellie Stevenson; secretary, Miss Mary Wallace; treasurer, Miss Mathews. The association will meet the last Tuesday of each month, and for the present will be purely a social organization. The first place of meeting has not been decided upon.

The physicians of Peoria inaugurated a movement to establish a medical library in that city. It is their hope to place within the reach of the physicians in compact form books appertaining to medical subjects and all the leading medical periodicals published in this country and abroad. These to be bound and an index record kept of each article and make them of important value. It is expected to fit up a room and employ a girl to take care of it and keep the index record up to date. Such a movement is to be highly commended and to be patterned after by other cities and towns.

MEDICAL SOCIETY NOTES.

The Morgan County Medical Society entertained fifty members and guests at a dinner at the Dunlap House November 20.

Rock Island County Medical Society held its regular meeting and dinner at the Horms Hotel, Rock Island, Ill., Dec. 9, 1907.

The Southern Illinois Medical Society held a two days' session at McLeansboro November 8 and 9. The meeting was very well attended and many interesting addresses and papers were given by members and invited guests.

Dr. Howard T. Ricketts delivered a public lecture in the Public Library Building Saturday evening, Dec. 7, 1907, under the auspices of the Chicago Medical Society. Subject, "The Method by Which Insects Carry Disease."

Dr. Sanger Brown delivered a lecture in the Chicago Public Library Building Saturday evening, December 1, under the auspices of the Chicago Medical Society, on the subject, "The Importance of Proper Ventilation in the Dwelling."

Dr. Willis O. Nance delivered a public lecture in the Public Library Building Saturday evening, Dec. 7, 1907, under the auspices of the Chicago Medical Society. Subject, "The Use and Abuse of the Eyes; Why So Many of Us Are Wearing Glasses."

The Livingston County Medical Society met November 17 at Forest, Ill. The program consisted of several papers and addresses, followed by a banquet. It is interesting to note that the meetings of county societies are affording more and better opportunities for acquaintance among the local profession and the spread of medical knowledge which comes from contact with other medical men.

At the annual meeting of the North Central Illinois Medical Association held at Sterling, December 2, the following officers were elected: President, Dr. Edward S. Murphy, Dixon; vice-president, Dr. J. P. Plum, Plainfield; secretary and treasurer, Dr. George A. Dicus, Streator; and censors, Drs. John C. White, Seatonville; William O. Ensign, Rutland; John F. Dicus, Streator; Arthur H. Harms, Sterling.

The Will County Society held its annual election of officers December 10, with the following result: President, Dr. M. W. Cushing; vice-president, Dr. W. O. McBride; secretary and treasurer, Marion K. Bowles; delegate to State Society, Dr. Watson H. Curtis, Wilmington; censor, Dr. F. W. Rulien; member of the Medicolegal Committee, Dr. Roy B. Leach; member of the State Legislative Committee, Marion K. Bowles.

The Physicians' Club of Streeter gave a banquet, on November 5, at the Plumb House. About thirty persons were present. Dr. George W. Bronson introduced the following speakers: Dr. R. Schurtz talked about automobiles. Dr. Lester discussed what Mark Twain said about Christian Science, and Dr. Conley told his opinion of banquets. Music and general discussion followed, and the occasion was marked by the usual general good time which these banquets afford.

Fifty members of the Will County Medical Association, with their guests, banqueted, November 12, at the Commercial Club at Joliet, Ill. After the dinner there were three scientific papers presented by guests from out of town. Dr. William A. Baum, President of the Illinois State Medical Society, sent greetings to the effect that the state organization is in a healthy and progressive condition. The evening was a most enjoyable one and another example of the great benefit to be derived for the physicians by social as well as scientific meetings.

The Fox River Valley Medical Association held its eighty-fifth semi-annual meeting Tuesday, November 12, at Aurora, Ill. The meeting was called to order by the President, A. A. Fitz of Batavia. After the usual order of business the following officers were elected: President, Dr. J. M. MacDonald, Aurora; vice-president, Dr. E. H. Abbott, Elgin; secretary and treasurer, Dr. George F. Allen, Aurora; member Executive Committee, Dr. H. E. Brennecke, Aurora; member Program Committee, Dr. J. W. Dryer, Aurora; member Board of Censors, Dr. R. G. Scott, Geneva; member Necrology Committee, Dr. C. H. Franz, Aurora; delegate to meeting of State Society, Dr. W. C. Bridge, Elgin; alternate,

Dr. J. W. MacDonald. A very interesting and scientific program was given, and the banquet was served by the "Ladies' Guild."

The Bureau County Medical Society held its semi-annual meeting and dinner, November 20, at Princeton. A number of out-of-town members and guests were present. A very interesting and instructive program was rendered, and the following officers were elected for the coming year: President, A. S. Rummell, Depue; first vice-president, J. F. Taylor, Buda; second vice-president, C. F. Horner, Tiskilwa; secretary and treasurer, O. J. Flint, Princeton; committees: Program, M. H. Blackburn, Princeton, Clyde Horner, Tiskilwa, O. J. Flint, Princeton; Publication, A. E. Owens, Princeton, T. C. Robinson, Wyanet, M. N. Gernsey, Dover; Necrology, A. C. Palmer, Princeton, W. C. Griswold, Princeton, J. F. Taylor, Buda; Board of Censors, A. S. Rummell, Depue, Frank Lewis, Depue; B. F. Landis, Tiskilwa; Arrangement, H. Owens, Princeton, C. C. Barrett, Princeton, J. H. Franklin, Spring Valley; delegate to State Society, C. F. Horner, Tiskilwa; alternate, O. J. Flint, Princeton.

Dr. Theobold Smith, professor of comparative pathology in Harvard Medical School, interested the Chicago Medical Society Wednesday evening, December 18, on the subject, "Some Neglected Facts in the Biology of the Tetanus Bacillus; Their Bearing on the Safety of the So-Called Biological Products." Dr. Smith is among the very first of the modern investigators in infectious diseases. Perhaps he is best known as the discoverer of the rôle played by the tick in the spread of Texas fever in cattle. Texas fever is caused by a protozöon blood parasite similar to the organism of malaria, and Professor Smith's discovery paved the way for the demonstrations by Ross and others of the rôle of mosquitoes in malaria and of Reed and his associates in yellow fever. He has also made discoveries of fundamental importance upon the relationship of the bacilli of human bovine tuberculosis, the pneumonia of hypersusceptibility, etc. Professor Smith comes to Chicago to receive the honorary degree of LL.B. at the University of Chicago.

The annual meeting of the North Central Illinois Medical Association occurred in Sterling December 3-4. The following was the program of the meeting: Necrological report: B. L. Bonar, M.D., Streator, by Dr. L. F. Dicus; A. C. Philips, M.D., Apple River, by Frank Anthony, Sterling. "A Few Salient Points in the Early Diagnosis of Pulmonary Tuberculosis," E. H. Butterfield, M.D., Ottawa. Discussion opened by A. B. Middleton, M.D., Pontiac. "Deep Alcoholic Injections in Trifacial Neuralgia," with a clinical report, D'Orsay Hecht, M.D., Chicago. General discussion. "Treatment of Appendicitis," T. W. Curry, M.D., Streator. Discussion opened by C. C. Hunt, M.D., Dixon, Ill. "The Physician from a Business Standpoint," S. O. Hendrick, M.D., Henry. Discussion opened by Wm. O. Ensign, M.D., Rutland. "Acute Frontal Sinusitis," with a report of cases, F. A. Guthrie, M.D., LaSalle. Discussion opened by H. S. Lester, M.D. Streator. "Infections of the Nasal Accessory Sinuses; Their Diagnosis and Treatment. Description of

Newer Methods of Bronchoscopy," George Paul Marquis, M.D., Chicago, General Discussion. "Non-tubercular Coxitis," Homer A. Millard, M.D., Minonk. Discussion opened by D. W. Jump, M.D., Plainfield. Volunteer papers and discussions. Banquet and evening program: On Tuesday evening a reception and banquet was given the members and invited guests at the Parish House at 6 p. m. by the Whiteside County Medical Society. The program was as follows: 8:15, President's address, "The Trend in Modern Medicine," E. P. Cook, M.D., Mendota; general address, A. E. Halsted, M.D., Chicago. The business meeting of the association will be held Wednesday.

A joint meeting of the Physicians' Club and the Lawyers' Club of Chicago was held at the Great Northern Hotel Friday evening, Dec. 13, 1907, at 6:30 o'clock, at which the subject, "Sense and Sentiment in the Treatment of the Criminal and Other Social Parasites," was discussed. The chairman of the evening was Judge William H. McSurley.

1. The Biological Aspect, Including Race Suicide for Social Parasites.[1]
   Dr. William T. Belfield.
2. The Indiana Movement.[2]
   J. N. Hurty, Secretary Indiana State Board of Health.
3. The Custodian's View and Experience.
   Mr. John L. Whitman, Superintendent Bridewell.
4. The Youthful Criminal.
   Judge John R. Newcomer, Municipal Court.
5. The Judicial Aspect. Judge Albert C. Barnes, Superior Court.
6. Humanitarian View. Prof. Graham Taylor, Chicago Commons.

It will be noted that the subject chosen for the evening discussion was not only one of great interest, but of great moment, one upon which the doctors and lawyers can get together in one fold and derive both pleasure and profit through the association. It is needless to say that it is highly gratifying to the Physicians' Club that it was able to bring about this joint meeting, and hope is expressed that the future holds more of them in store. The realization of the baneful influence exerted upon every element of society through the maudlin sentimentality so constantly displayed toward even the most vicious of criminals brought this subject prominently into the foreground, and the strong program presented the various factors in its causation and rational line of procedure toward its amelioration and cure. The meeting was the largest and most successful which the Physicians' Club has ever known, the attendance amounting to something more than 170, and the spirit and enthusiasm manifested were such as to command attention and rivaled that displayed in the more enthusiastic gatherings to promote any kind of progressive movement. The speakers were given a royal welcome, and each speaker held the attention of his audience during the entire discourse.

1. See abstract, page 69.
2. See abstract, page 70.

STATE BOARDS AND PUBLIC HEALTH.

Three cases of diphtheria are reported from Canton.

It is now reported that Peoria has no smallpox cases.

Scarlet fever is reported to be spreading rapidly in Waukegan.

Pneumonia is reported to be very prevalent in the region of Kane.

The Lincoln Schoolhouse, Bloomington, has been closed on account of diphtheria.

An epidemic of scarlet fever, measles and diphtheria has been reported at Waukegan.

An epidemic of diphtheria has caused the closure of three country schools northwest of Mattoon.

Chillicothe is reported to have an epidemic of scarlet fever, from which several deaths have resulted.

The children's hospital connected with Cook County Hospital is closed on account of an epidemic of varicella.

An epidemic of scarlet fever has been reported at Lacon, Ill. This town has had a similar epidemic two winters previous.

The health department of Rockford reports that diphtheria has been very prevalent for several weeks, but is now well under control.

The Chicago Tuberculosis Institute has opened six special free dispensaries for the treatment of consumption and the spread of information regarding its prevention.

Dr. Frank C. J. Brooks, Rockford, charged by the health department with failing to report a case of diphtheria and thereby violating the health ordinance, is reported to have been fined $10 and costs November 23.

Smallpox cases have been reported in the following towns: Springfield, Elizabeth (in the latter town nearly all cases have recovered), Bishop, Griggsville, Robinson, Oblong, Jacksonville, Pekin, Decatur, Hillsdale.

The Board of Commissioners of Cook County, at its last meeting, decided to urge the city of Chicago to take charge of its alcoholic and contagious patients. It also recommends the erection and maintenance of a home for convalescents.

A board of commissioned medical officers will convene in Washington, January 20, for the purpose of examining conditions for assistant surgeon in the Public Health and Marine-Hospital Service. Further information may be had by addressing the Surgeon General at Washington, D. C.

Typhoid is prevalent at various towns throughout the state. An epidemic has been reported at Mattoon, necessitating the closing of

schools. Cases have also been reported at Rockford and Canton. A general epidemic is reported in Lawrence County and stringent efforts are being made to limit the spread of the disease, even the daily press advising the use of antitoxin.

The State Board of Charities is making plans for the merging of the management of the charitable institutions of the state. By this means it is hoped to place the institutions on a plan of management which will result in the greatest good to the wards of the state and at the same time will reduce in great measure the expense of maintenance.

During November 2,160 deaths were reported in Chicago, 109 fewer than the preceding month and 226 fewer than for the corresponding month of 1906, the respective annual mortalities per 1,000 being 12.47, 12.67 and 14.17. Pneumonia caused 322 deaths; consumption, 238; heart disease, 201; violence (including suicide), 161; nephritis, 155; acute intestinal diseases, 119; cancer, 102; diphtheria, 47; scarlet fever, 46; influenza, 10; and measles and whooping cough, each 6.

The Surgeon General of the Public Health and Marine-Hospital Service, Washington, announces that on Jan. 20, 1908, a board of officers connected with that bureau will be convened for the purpose of examining candidates for admission to the grade of assistant surgeon in that Service. Candidates must be between 22 and 30 years of age, and will receive on admission a salary of $1,600, with furnished quarters for themselves and family. Full particulars can be obtained by addressing the Surgeon General at Washington, D. C.

Ninety-five cases of smallpox were reported to the City Board of Health in Springfield during the month of November, a larger number than has occurred in the city for twenty-five years. This epidemic is said to have been due to an effort on the part of one of the parochial schools to collect waste paper in sufficient amount to make a carload, for which the school was to receive $100. The children are said to have collected this paper from all sorts of places, in some instances taking wall paper from old houses where it is presumed that smallpox had prevailed. The disease has existed in a very mild type and up to December 10 no deaths had occurred during the epidemic.

At a meeting at which twenty health officers from Chicago and surrounding towns were present, held December 7, the Chicago Suburban Health League was organized as a permanent society to safeguard the health of Chicago and surrounding territory. The territory of the league extends north to Kenosha, Wis., west to Aurora and Elgin, and south to Whiting, Ind., and Chicago Heights. The following officers were elected: Dr. William R. Parks, Evanston, president; Dr. Albert F. Storke, Oak Park, vice-president; Dr. Heman Spalding, Chicago, secretary and treasurer; and Drs. William A. Evans, Chicago; S. Gordon MacCracken, Winnetka, Aaron J. Lauer, Whiting, Ind.; Clarence W. Geyer, Aurora, and Albert F. Storke, Oak Park, executive committee.

The Illinois Legislature has adopted a new law for the regulation of the sale of cocain. It provides that it shall be unlawful for any drug-

gist or other person to retail, sell or give away cocain, alpha or beta eucain, or any compound or derivative of any of them, or any preparation or compound containing any of them, except on the written prescription of a duly registered physician, which prescription must contain the name and address of the person for whom it is prescribed. The druggist filling the prescription is instructed to place the date on it and to retain the original on file, to fill it but once and to give no copy to any person. The wholesaling of these substances is not interfered with, provided the wholesale dealer affixes a label to the package stating the name and quality of the sale and marked "Poison," with the name and place of business of the seller. Wholesale dealers are required to keep a record of all sales showing the date, quantity and form and the name and address of the purchaser. It is also unlawful for any registered physician or any other person to prescribe, sell or offer for sale any cocain or derivative or substance containing cocain to any persons addicted to the habitual use of the drug. Violation of the provisions of the act is constituted a misdemeanor punishable by fine or imprisonment or both. If the offender is a registered physician, dentist or pharmacist, conviction for such an offense constitutes a revocation of his license.

During the past few weeks the laboratory of the Department of Health of Chicago has been making experiments seeking to devise some simple method for the home pasteurization of milk. Among the various methods tried the following is recommended as the simplest and most effective. It is, in effect, that originally proposed by the assistant commissioner in his circular on the "Hot Weather Care of Infants and Young Children: 1895." A quart bottle of milk, with the stopper in it just as it comes from the milkman, is set upon a saucer or other small plate in a two-quart granite boiler. The boiler is filled with cold water up to within an inch or two from the top of the milk bottle. It is then placed over the fire and allowed to remain until the water around the bottle begins to boil. It is then at once taken off the fire and set aside to cool. The water must not be allowed to boil for any length of time and the milk must be cooled in the water, the entire process consuming about forty or forty-five minutes. This treatment will destroy practically all the bacteria present, especially the pathogenic ones, such as typhoid bacilli, which have been carefully studied and have been destroyed by this method. Such a bottle of cooked milk, if kept in the ice box, will remain sweet for over a week. If careful attention is paid to the above directions the milk will have only a very slight, if any, suggestion of "cooked" taste, while its nutritive and digestible qualities will not be impaired.

The following notice of the International Congress on Tuberculosis appeared in the October number of the *Bulletin* of the Illinois State Board of Health: "The National Association for the Study and Prevention of Tuberculosis has created a special committee on the International Congress of Tuberculosis. The committee on the congress has enlisted the interest of the federal government. Seven of the govern-

ment departments have signified their intention to participate in the international congress. These are the department of State, of the Treasury, of War, of the Navy, of the Interior, of Agriculture, and Commerce and labor. The governors of the states composing the United States have all been notified and most of them have taken official action in favor of the International Congress on Tuberculosis. The organized agencies in the United States, official and voluntary, have been advised concerning the International Congress on Tuberculosis and are making active preparations for that important event. Governor Deneen has appointed several delegates to the meeting of the congress, who have also been appointed members of the Illinois committee to prepare for the congress. Dr. George W. Webster, president of the State Board of Health, has been elected chairman of this committee. Governor Deneen is an ex-officio member of this committee. The section work of the congress will be done in the week of Sept. 28 to Oct. 3, 1908. During that week there will be two general meetings. During the three weeks from September 21 to October 12 a tuberculosis exhibition will be opened and a course of special lectures by distinguished men will be in progress. Clinics and demonstrations of unusual interest will be arranged for the whole period.

A "health clearing house" for the city of Chicago, all its suburbs, towns and cities within the radius of fifty miles of the city is the practical outcome of a conference of the health officers of these communities, held during the past week on a call issued by the commissioners of health of Chicago. In outlining the purpose of the conference it was said that need of a practical corporation of all health officers of surrounding towns with Chicago is daily in evidence. The lesson of recent epidemics of scarlet fever, diphtheria and typhoid is unmistakable. The number of persons who daily visit Chicago from outlying towns and cities make it possible for disease contracted in one section to be carried miles away to another district, and in the same way contagion in Chicago may be taken to a far-off suburb. It is evident that there should be no political boundary lines in sanitary affairs. There is a common cause, and united action must obtain if the duties of an important office are to be discharged as fully and effectively as possible. As one of the important features of the corporation it was suggested that there be established what may be properly termed a "health clearing house" for this district. Daily reports of contagious diseases and other matters pertaining to the public health can then be made to one central point, and from there a statement of the salient features of these reports will be immediately forwarded to the associated boards of health. The suggestion was also offered that the Chicago Department of Health shall devote a page of its weekly bulletin to matters of special interest to surrounding towns, and that the laboratory facilities shall be made available to all departments of health in the association, each to bear the expense of its individual cases. It was further pointed out that through organization of this kind considerable economy in the purchase of supplies would result to the smaller towns.

The following items from the *Bulletin* of the Department of Health in the City of Chicago are of interest to the medical profession: "November, 1907, passes into record as one of the most healthful months Chicago has ever known, thus fulfilling the prediction made in a recent issue of the *Bulletin*. Only once in the last fifty years has the November death rate been lower, the lowest record being in 1904, a year of phenomenal healthfulness. A total of 2,160 deaths were reported to the Bureau of Vital Statistics during the month, this being 109 fewer than the preceding month and 236 fewer than the corresponding month of last year. In the meteorologic records of November is to be found an explanation of the low mortality of the month. The reports of the weather bureau show that the average temperature of the month was considerably in excess of the mean of the past thirty years, and that the percentage of possible sunshine was much greater than the average. Thus the weather conditions were such as favor outdoor life and the free ventilation of living quarters, two factors that are far-reaching in their effects upon health. The ideal weather conditions that have prevailed during the month have delayed the advent of the pneumonia season. The city hospitals contain far fewer than the usual number of pneumonia patients, and the mortality from this disease and from bronchitis is considerably lower than is customary at this time of year. The attention of the department has recently been directed to the ventilation of street cars and, after due consideration of the conditions, the commissioner has decided to recommend to the traction companies that an open trailer be attached to each train for the accommodation of people that recognize that danger lurks in the air of closed, unventilated cars, and who realize the healthful effects of the open air."

The October and November *Bulletin* of the State Board of Health contains the following clinical reports of antitoxin administration: "Two hundred and eighty-six clinical reports on the administration of the antitoxin furnished by the State Board of Health have been received by the board from public-spirited physicians throughout the state during the period from Oct. 12 to Nov. 12, 1907. There are some points of more than passing interest in connection with these reports. Of the 186 injections given, 134 were for immunizing purposes. The remaining 52 constituted curative treatments in persons suffering from diphtheria. Complete recovery resulted in 147 of the 152 cases, no sequelæ being noted in any instance. There were five deaths, a death rate of 3.29 per cent. of the total number having the disease. But it might be truthfully said that there was practically no death rate in those cases in which antitoxin was administered early, for to none of the patients in whom the disease terminated fatally was antitoxin given early in the course of the disease. In one case the antitoxin was given on the tenth day, in another in the last stages, and in still another on the fifth day. In two instances this curative agent was administered respectively on second and third days, but there is no evidence that over 3,000 units were used. These facts will serve to further accentuate the urgency of the early administration of antitoxin and the frequent repe-

tition of the dose, provided favorable results do not follow the first injection. As an illustration of the aseptic technic employed in the injections, and the degree of refinement of the serum used, we will say that in only two of the 286 individuals in whom injections were given were there any unusual or peculiar results. These two patients had a slight erythematous eruption at the seat of injections, but this passed away quickly without further symptoms."

NEW INCORPORATIONS.

Olney Sanitarium, Olney; capital increased from $25,000 to $40,000.

Peoria Medical Library Association, Peoria; incorporators, E. E. Gelder, E. E. DuMars, J. F. Duane.

Park Avenue Hospital and Training School for Nurses, Chicago; capital increased from $5,000 to $40,000.

American Hospital of Medicine, Surgery and Osteopathy, Chicago; incorporators, A. F. Heimlieh, D. Littlejohn, J. B. Littlejohn.

Anti-Compulsory Vaccination of Chicago, to oppose vaccination; incorporators, J. H. Green, M.D., Kate Reid and O. H. Mann, M.D.

A. Adolphus Span, dermatologist, Chicago; capital, $10,000; medical; incorporators, Ben F. Brady, David G. Einstein, Thomas J. Johnson.

CHANGE OF LOCATION.

E. A. Elden has removed from Moline to Hayes, S. D.

Dr. B. Taylor, of Westville, has removed to Harrisburg, Ill.

Dr. Edwin W. Crum has removed from Glasgow to Palmyra.

Dr. W. H. O'Malley has removed from Kinsman to Kewanee.

David Littlejohn, M. D., has removed from Pontiac to Chicago.

Dr. L. D. McClure has removed from Adrain, Ill., to Nara Visa, N. Mex.

Dr. Watson, of Dixon, Mo., has located in Litchfield for the practice of his profession.

Dr. J. A. McGoey, of Thirty-fifth and State streets, Chicago, has removed to Kinsman.

Dr. Jacob Franks has changed his residence from 17 Lincoln Ave., to 49 Pine Grove Ave., Chicago.

A. L. Casbern, M.D., of Bentley, has bought the practice of Dr. L. D. McClure and removed from Bentley to Adrain.

MARRIAGES.

Emil Arthur Rach, M.D., to Miss Ella Boyle, both of Chicago, November 6.

Dwight C. Orcutt, M.D., to Miss Grace Leach, both of Chicago, December 3.

CARL BRADEN DAVIS, M.D., to Miss Elsie Booth, both of Chicago, December 10.

J. J. PLEAK, M.D., of Hillsboro, and Miss Freda Liens, of Augustus, Ky., Dec. 4, 1907.

J. HOWARD P. O'NEIL, M.D., to Miss Josephine Mary Carson, both of Chicago, November 6.

LEWIS A. HARRIS, M.D., St. Charles, Idaho, to Miss Fannie T. Levy, of Chicago, November 25.

PETER BASSOE, M.D., Chicago, to Miss Miriam Gardner, of Pasadena, Cal., November 30.

FRANK M. HORSTMANN, M.D., Rice Lake, Wis., to Miss Mabel Hepburn, Chicago, October 9.

JAMES GRAY CARR, M.D., Chicago, to Miss Esther Margaret Foxcraft, of Cambridge, Mass.

EDWARD BOWIE, M.D., of Jacksonville, and Mrs. Anna Conover Linkins, of Bluffs, November 24.

JOHN K. MCQUARRIE, M.D., Chicago, to Miss Fannie Maxwell, of Millersburg, Ohio, Dec. 4, 1907.

FRED H. BAPMAN, M.D., Bloomington, Ind., to Miss Pansy A. Runner, of De Kalb, Ill., December 9.

JAMES M. KIRK, M.D., Pasadena, Cal., to Miss Anna McKay, of La Salle, Ill., at Milwaukee, Wis., recently.

WILLIAM A. EVANS, M.D., Chicago, to Miss Ida May Wildberger, of Memphis, Tenn., at Chicago, November 30.

GEORGE C. STEMEN, M.D., Denver, Colo., to Mrs. Madge Hays Beardsley, of Decatur, Ill., at St. Louis, November 6.

At a meeting of the Chicago members of the class of 1893, College of Physicians and Surgeons, Chicago, held Nov. 26, 1907, a committee presented the following tribute to the memory of Samuel J. Boyd. A copy of this testimonial was ordered sent to the widow of Dr. Boyd, to THE ILLINOIS MEDICAL JOURNAL and to the *Plexus:*

IN MEMORIAM.

SAMUEL J. BOYD, M.D., BORN 1861—DIED 1907.

Tribute of the Chicago members of the class of 1893, College of Physicians and Surgeons, Chicago.

By the death of Samuel J. Boyd, M.D., the class of 1893, College of Physicians and Surgeons, Chicago, mourns the loss of one of its most active and efficient members. His affable nature and courteous dignity, his entertaining and instructive conversation, won him the highest esteem from the members of the class and the love and respect from the people he met from all walks of life. He has added luster to society and to the medical profession of which he was a member by contributing his

indefatigable industry, his integrity, his patriotism, his public spirit and rare abilities.

With his professional associates he was able and earnest without pretention, always faithful and dependable, preserving their utmost confidence in him and gaining him the respect and admiration of all. With the suffering he was sympathetic, with the needy charitable. A more adequate comprehension of his character and whole life can be gained by the sentiment of Abraham Lincoln, "Charity for all and malice toward none." [Signed]

WELLINGTON T. STEWART, M.D.
EMMET L. SMITH, M.D.
JOSEPH L. ABT, M.D.
ANDREW M. HARVEY, M.D.

DEATHS.

REDFORD W. FISK, M.D., Eclectic Medical Institute, Cincinnati, 1878, died at his home in Quincy, Ill., July 26, aged 60.

GEORGE CALLOWAY, M.D., Medical College of Ohio, Cincinnati, 1873, died at his home in Tuscola, Ill., in October last, from disseminated sclerosis, aged 63.

EMORY BALLOU, M.D., University of St. Charles, Ill., Medical Department, 1845, died at his home in Nunda, Ill., November 27, after a prolonged illness, aged 83.

JOHN H. PENNER, M.D., Louisville, 1854-56, died at his home in Lawrenceville, Ill., November 2, from disease of the lungs, after an illness of three months, aged 75.

FREDERICK H. STEVENS, M.D., Vermont Academy of Medicine, Castelton Medical College, 1851, of Caldwell, N. Y., died at the home of his daughter in Chicago, December 1, aged 82.

THOMAS HAERING, M.D., Bloomington, died Dec. 20, 1907. Dr. Haering was a native of Bavaria, born Feb. 6, 1833, and came to Bloomington in 1867, where he has practiced ever since.

F. MARION CRANE, M.D., Pittsfield, aged 45, died of heart disease. Dr. Crane was a member of the Pike County Medical Society and Illinois State Medical Society and a prominent Mason.

EDWARD C. ELLET, M.D., Jefferson Medical College, Philadelphia, 1849, for more than fifty years a practitioner of Bunker Hill, Ill., died at the home of his daughter in Alton, Ill., November 4, aged 88.

LUCIUS W. BLAKESLEY, M.D., Eclectic Medical Institute, Cincinnati, 1844, for forty-eight years a resident of Aurora, Ill., died at his home in that place from carcinoma of the liver, October 29, after an illness of three months, aged 86.

SAMUEL J. BOYD, M.D., College of Physicians and Surgeons of Chicago, 1893, a member of the American Medical Association, died at his home in Chicago, November 20, from myocarditis, after an illness of about four years, aged 46.

GEORGE H. CARDER, M.D., Chicago Homeopathic Medical College, 1882, for twenty years a practitioner of Auburn Park, Chicago, and later at Pasadena, Cal., died suddenly at the bedside of a patient of that city, November 4, from heart disease, aged 57.

JAMES LEDLIE ADAMS, M.D., Chicago, Rush Medical College, Chicago, 1902, member of the Illinois State and Cook County Medical Societies, died at the Baptist Hospital, Chicago, December 3, from endocarditis, after an illness of four weeks, aged 29.

FREDERICK WHITCOMB CURRIER, M.D., of Springfield, aged 39 years. Dr. Currier was born in Springfield and graduated at the Beaumont Hospital Medical College in St. Louis in 1894, since which time he has been engaged in the practice of medicine in his native city.

JULIUS W. OSWALD, M.D., Rush Medical College, 1887, a member of the American Medical Association, chief surgeon on the staff of Alexian Brothers Hospital, Chicago, and surgeon to Maurice Porter Hospital, died at his home in Chicago, December 15, from paralysis, after an illness of four years, aged 44.

JOSEPH HALLER, M.D., Northwestern University Medical School, Chicago, 1862, of Lanark, Ill., contract surgeon in the army during the Civil War, a member of the Illinois State and Carroll County Medical Societies, died at the Rockford Hospital, December 11, two weeks after an operation for subphrenic abscess, aged 71.

J. C. O'CONNOR, M.D., of Buffalo, Sangamon County, died Dec. 12, 1907. He had practiced in Buffalo for a great many years, and was a graduate of Rush Medical College in the year 1878. His wife and one daughter survive him. The burial by the Masonic order took place Sunday, December 15, a large number of members and professional friends attending.

WILLIAM LINCOLN DOWNING, M.D., Rush Medical College, Chicago, 1886. A member of the American Medical Association, Tri-State Medical Society of Iowa, Illinois and Missouri, and Des Moines Valley Medical Association; local surgeon of the Chicago, Burlington & Kansas City and Wabash Railways at Moulton, Iowa. Died at a hospital at Chicago, November 2, after an illness of six weeks, aged 45.

J. HOMER COULTER, M.D., Medical College of Ohio, Medical Department of the University of Cincinnati, 1885; formerly a specialist on diseases of the ear, nose and throat of Chicago; a member of many medical societies and professor in Harvey Medical College and Chicago Clinical School, died in the Illinois Northern Hospital for the Insane, Elgin, July 24, from general paralysis of the insane, aged 46.

WESLEY W. ESSICK, M.D., Medical Department of the University of Nashville, Tenn., 1882; a member of the Illinois State and Jackson County Medical Societies; professor of railway surgery in the College of Physicians and Surgeons, St. Louis; local surgeon of the Mobile & Ohio Railway, and a member of the Board of Health in Murphysboro, Ill., was run over by a switch engine and almost instantly killed at Murphysboro, November 15, aged 53.

JOHN ELLSWORTH COVEY, M.D., of Bloomington, died in that city, December 13, of cancer of the stomach. Dr. Covey was born near Le Roy, Oct. 16, 1861, and was a graduate of the Wesleyan University of Bloomington and of Rush Medical College. He first practiced in Lexington, but later removed to Bloomington, where he soon became a prominent member of the profession. He was a member of the Baptist church and superintendent of the Sunday school. His wife and two children survive him.

JAMES H. COLLINS, M.D., ambulance surgeon at the Fifteenth Precinct Ambulance Station. Dr. Collins was a medical graduate of the University of Toronto in 1889 and came to Chicago in 1891. In 1894 he was appointed a school inspector on the Board of Education and served in that capacity until 1902. He passed among the first twelve in the civil service examination for ambulance surgeons held last summer and was appointed to the service on July 23. He died on Thursday, Nov. 7, 1907, at St. Bernard's Hospital of lobar pneumonia.

CHAS. J. GRASER, M.D., Springfield, Ill., died of typhoid fever at St. John's Hospital, Nov. 19, 1907. Dr. Graser was born in Springfield in 1872 and, after graduation at the High School and a course in pharmacy, was in the drug business until he entered Northwestern University Medical School in 1900, from which he graduated in 1904, and has practiced in Springfield since that time, being associated with Dr. D. M. Ottis. The Sangamon County Medical Society held a special meeting on the 19th and adopted appropriate resolutions regarding Dr. Graser's death.

THE DEATH OF NICHOLAS SENN.

NICHOLAS SENN, "master surgeon," pathologist, teacher, patriot and loyal friend, died, January 2, at his home in Chicago, from dilatation of the heart, aged 63 years, 2 months and 2 days.

He was born in Buchs, Canton of St. Gall, Switzerland, Oct. 31, 1844, came with his parents to the United States in 1852 and settled at Ashford, Wis. In 1865 he entered Chicago Medical College, and graduated with first honors in 1868. He commenced practice in Ashford. Five years later he moved to Milwaukee. In 1877 he returned to Europe, and, after studying at the University of Munich, received a degree in medicine in 1878. He then practiced in Milwaukee until 1893, when he took up his permanent residence in Chicago.

Dr. Senn was a member of the staff of the Milwaukee Hospital, and later surgeon-in-chief to the St. Joseph's Hospital and Presbyterian Hospital, Chicago.

Dr. Senn was a member of many scientific societies. In 1896 he delivered the oration on surgery, and in 1897 was president of the American Medical Association. He founded the Association of Military Surgeons of the United States in 1891 and was its president for two years. He was also the founder of the Association of Military Surgeons of the State of Illinois in 1893, and has been its president during the entire existence of the organization.

His career as a medical teacher began in 1884, when he was elected

professor of principles and practice of surgery in the College of Physicians and Surgeons, Chicago. In 1888 he was made professor of principles of surgery and surgical pathology in Rush Medical College, and in 1891 professor of practice of surgery and clinical surgery in the same institution. Later he was appointed professorial lecturer and then professor of military surgery in the University of Chicago. He was also professor of surgery in the Chicago Policlinic. Dr. Senn was a thorough teacher and held the attention of his classes closely by the interest with which he invested the topic on which he was lecturing. His information was universal and perfectly classified, he was never at a loss for a word, and could always supply the names of authorities, dates and particulars, and this off-hand, without refence to notes. His style of delivery was dramatic and his audiences never tired. The students never stayed away from his clinics and the amphitheater was always filled.

NICHOLAS SENN, 1844-1908.

As a surgeon Dr. Senn was probably the best known and most universally esteemed in the United States. His fame was not local, but extended far beyond the confines of America to Europe, Africa, South America and the far East. He was a skilful and always conservative operator and a most eloquent clinical lecturer. In plastic surgery he excelled. To detail the surgical procedures he has devised based on careful experiment and observation, and to describe his methods of operating would require far more space than could be permitted in this notice. His research work on military surgery, and especially first aid on the battle field and the conservative treatment of gunshot wounds, has attracted the attention and compelled the admiration of the surgeons of the world.

Dr. Senn in 1888 was made surgeon general of Wisconsin and retained this position until he left the State. In 1892 Governor Altgeld commissioned him surgeon general of Illinois, and this position he held through various administrations until his death. On the outbreak of the

Spanish-American War he at once repaired to the state mobilization camp at Springfield and assumed charge.

He was commissioned lieutenant colonel and chief surgeon, U. S. V., May 13, 1898, and was assigned to duty with the Sixth Army Corps at Chickamauga Park, Georgia. He accompanied the expedition under command of Brig.-Gen. Guy V. Henry, U. S. V., to Santiago, Cuba, and was assigned to duty as chief surgeon of the operating staff with troops in the field. He was on duty with the Army of the Invasion near Santiago until July 14, when he reported for duty on board the U. S. Hospital Ship *Relief*. On August 20 he proceeded to Montauk Point, Long Island, N. Y., and was placed in charge of the surgical work at that place. He resigned September 6 and was honorably discharged September 17.

Dr. Senn was a prolific contributor to the medical literature. Prominent among his writings, which number more than 300 titles, are his text-books on "Experimental Surgery," "Intestinal Surgery," "Surgical Bacteriology," "Principles of Surgery," "Tuberculosis of Bones and Joints," "Genito-urinary Tuberculosis," "Pathology and Surgical Treatment of Tumors," and "Practical Surgery."

In the opinion of his attending physician, Dr. Senn gave a plain history of chronic interstitial myocarditis, running back beyond a period of two years. He did not recognize the plain manifestation of the lesion, but imagined himself even at this time to be a prodigy of physical and mental endurance. The acute manifestations of his illness were precipitated by his tour around South America. Immediately before his arrival on that continent he was disturbed by an acute intestinal derangement, and soon after his arrival he imprudently ascended a great mountain to an altitude of 16,000 feet. The phenomena of acute dilatation of the heart immediately appeared and continued until his death. On his arrival at home he showed an enormously dilated heart with gallop-rhythm, marked pulmonary stasis with edema, extreme dyspnea and great anasarca. The circulatory disturbance was not durably benefited by medicinal treatment. Periods of temporary improvement were interrupted by periods of aggravation. As part of the general vascular stasis connected with the dilatation, a rather acute ascites made its appearance, suggesting the pre-existence of some impediment to the portal circulation. About two weeks before death an acute nephritis was engrafted on the course of a chronic passive congestion of the kidneys, and this was the feature of his illness that precipitated the fatal termination.

Nicholas Senn was truly great; master of his profession; a patriot, always ready to sacrifice his personal interests and comfort for the service of his adopted country; intensely loyal in his friendships; generous to a fault; simple-minded; too honest to harbor suspicions; a man of singularly clean speech, never profane nor vulgar. His greatest glory was in his extraordinary capacity for work, which he held as duty, and that work entirely for the betterment of his fellow men. Of him it may with truth be said that the world is better for his having lived.